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THE PUNJAB OF TO-DAY.



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THE PUNJAB OF TO-DAY.

VOL. I.

AN ECONOMIC SURVEY OF THE PUNJAB
IN RECENT YEARS (1890—1925)

By

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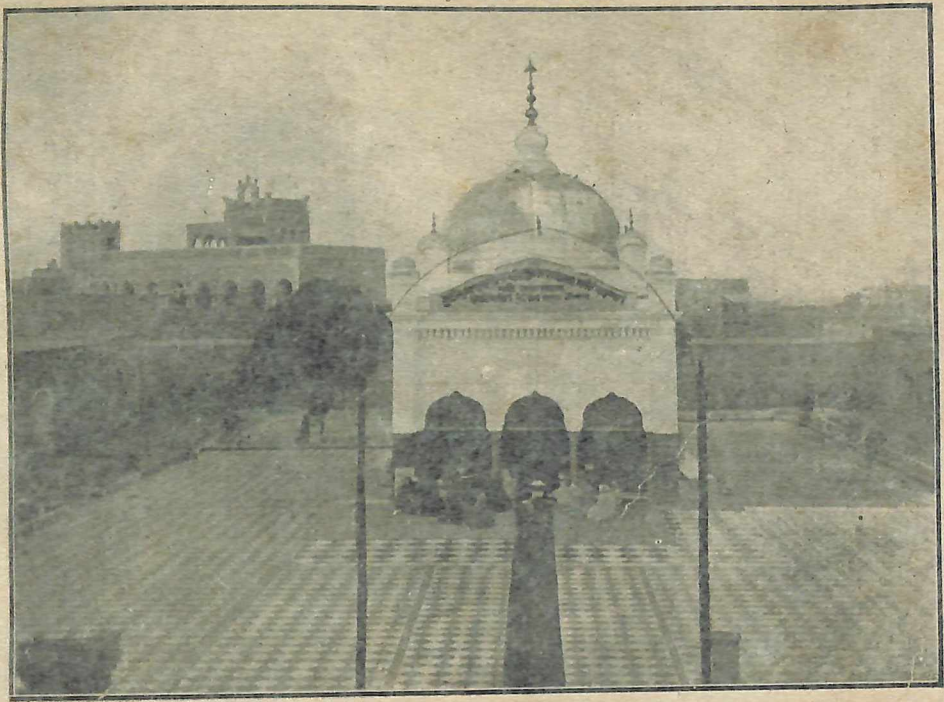
The Abbot's house, whence he directed the massacre.

The Holy of Holies to which the survivors fled for refuge and were afterward shot down.

Parapets from which the Pathans fired on the Sikhs.

Pilgrims to the Shrine.

Parapets from which the Pathans fired on the Sikhs.



THE SIKH SHRINE AT NANKANA (Interior).

The interior of the Gurdwara Janam Asthan (Birthplace of Guru Nanak). On the left is the Residence of the Abbot, who was imprisoned for Nankana.



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PREFACE.

For many have pictured republics and principalities which in fact have never been known or seen, because how one lives is so far distant from how one ought to live that he who neglects what is done for what *ought to be* done, sooner effects his ruin than his preservation.

Machiavelli : The Prince, Chap. XV.

There are not many men who can write with authority upon Indian affairs, because the knowledge of most is conditioned by a particular point of view, or a particular field of experience, whilst few know more than a fraction of that big country.¹ To say that India is as large as, and more varied than all Europe excluding Russia conveys little to the imagination till it is realised how difficult it would be to include Belgium and Bulgaria, Poland and Portugal, Ireland and Italy in a generalised description. Such generalisations lose in accuracy and picturesqueness what they gain in breadth; and when dealing with India tend inevitably to confine themselves to the activities of the centralised Government at Simla, and to ignore the people whose interests that Government is supposed to serve. In any case books dealing with India as a whole are so numerous that it would be superfluous to add to their number. In selecting from this vast area a particular Province, it may be possible to approach Indian problems from a fresh point of view, and to get a clearer insight into the way in which its peculiar form of Government reacts on the life of the masses.

In calling this book an economic survey I have used the term "economic" in its widest sense. "For the basis of economic life and consequently of economic theory is practically universal and all-embracing; it is the necessity for 'making both ends meet.' Economy is not a particular

¹ *Firmness* 7. For this and all other abbreviated reference to authorities, the list of Authorities on p. vii should be referred to.



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branch or department of human life, as is often believed, it is an aspect of almost all human activities, or those activities regarded from a particular point of view."¹ It is important not only to the soul, but also to the body of a man as to whether he prefers to spend his superfluous wealth on a cathedral or a casino, a civil case or a concubine. The absurd economic man, strutting solemnly through a Ricardian universe, without parts or passions, must be either a god or a beast, and has rightly been relegated to the limbo where abide Divine Right, the Social Contract and other untimely births. Even now text books on Economics tend to ignore the effect of social, religious, legal and political systems on economic life, and this book will have served one purpose if it shews that (in the Punjab at any rate) they are of the utmost importance.

A book of this kind, which endeavours to take a wide survey of every aspect of life of a country as large as Great Britain and to render it intelligible to the ordinary reader, must necessarily generalise considerably, and make statements which are true on the whole, but which may nevertheless be subject to qualifications in detail. I have stated (for example) that a Jat Sikh is a better cultivator than a Muhammadan Rajput. Yet I have known Muhammadan Rajputs who were quite good cultivators and in many Jat Sikh villages in the Amritsar district the cultivation is abominably bad. Nevertheless the statement is true, on the whole, and is a sufficiently accurate generalisation for the purpose of this book, which is to give a broad outlook on the Province as a whole. I leave it to others, to the experts in particular aspects of Governmental or social activity, to supply the expert and specialist knowledge which I lack. Admirable works of this kind are the Land Administration and Settlement Manuals of Sir James Douie, and the Colony Manual of Messrs. Beazley and Puckle² which are classics of their kind, and on which I have largely drawn for Chapters II and III of this Book. It is unfortunate that

¹ *E.J. Hist.* (Jan. 1929) 527.

² See references *I.A.M.*, *S.M.* and *C.M.*



there are no other books of equal merit dealing with other aspects of State activities, though the works of Messrs. Calvert and Darling¹ on the sociology and of Messrs. Roberts and Faulkner on the agriculture of the Province are masterpieces of their kind. Possibly this book may induce others to imitate these writers and to amplify my generalisations and correct my mistakes in authoritative works on the Irrigation, the Industries, the Law and Judicial Procedure of the Province. Even then I hope this book may still serve as an introduction to those more exhaustive treatises, and one which will be more intelligible to English readers than more technical works can be. Some information, which might be boring to the general reader, but yet might interest the more laborious student of economics, I have relegated to the Appendices.

An economic survey presupposes some knowledge of the economic history of the country dealt with. And this is particularly necessary in India, not so much because the past is more important there, as because less knowledge of Indian history can be assumed from the English reader than of the history of any European country. Before therefore dealing with the subject topically I have given a short historical introduction in Chapter I, which approaches it from a chronological point of view, and will help to co-ordinate what follows. As, however, my "Land of the Five Rivers" gives an economic history of the Punjab up to the year 1890 in some detail; I have in this book only given a very brief outline of the period prior to that year, except in the case of Frontier and Irrigation problems, which I had not dealt with in the previous work. Those therefore who are interested in history, and who find the historical parts of this book too cursory to be intelligible I would refer to the fuller treatment in the "Land of the Five Rivers." The main part of this book divides the subject matter into sections more or less complete in themselves. This will, I hope, make the book more useful, as a work of reference, for which purpose I would also recommend a liberal resort

¹ See references Calvert, Darling, and Roberts in list of authorities.



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to the index. The "conclusion" at the end summarises the main points dealt with in the book, and may prove interesting to those who have not time to read the book as a whole.

Throughout the book will be found copious references to authorities relied on, and a list of these is given on p. vii. While, however, I have used these authorities to refresh my memory and as a frame-work for certain technical portions of the book, my main authority is my own experience. For twenty-three years I have served in the Punjab, during which time I have visited nearly every part of it. As District Judge I have seen things from a judicial stand-point, while as Deputy Commissioner and Sub-Divisional Officer I have experienced the difficulties of an executive officer. My experiences as Recruiting Officer during the War, and in the Co-operative Department subsequently have enabled me to get a glimpse of things from the point of view of the peasant. As Director of Land Records and Inspector-General of Registration again I had the opportunity of touring the province, hearing what everyone had to say, and testing my generalisations by the experience of officials and non-officials of different districts and different departments. This first-hand information enabled me to supplement and correct the information which I obtained from writing the Punjab Administration Reports, a duty which was entrusted to me between the years 1921 and 1925.

It was the writing of these Reports and the desire to make better known some of the information which I had so laboriously acquired for that purpose, that first suggested to me the idea of writing this book.

The subject is a serious one, but I have not always treated it too seriously. In doing so I am following the advice of Kipling¹ and the dictates of common-sense. To view too seriously the tragi-comedy of an Indian Province, to see the Punjab with its magnificent possibilities, the finest peasantry in the world under the guidance of rulers

¹ Plain Tales from the Hills. Thrown Away.



PREFACE.

to whom empire-building is a tradition, its mighty rivers rolling down to the sea through a soil of almost inexhaustible fertility from mountains rich in forest and mineral wealth—to see this great stream of possibilities perishing in the bogs and sands of futile political controversy is too heartbreaking. That way madness lies! Comic relief is essential to sanity. This explains much of the superficial frivolity of the life of European exiles in India, a feverish endeavour to drown the realisation of the essential futility of their endeavour in the intoxicant of a forced gaiety. And when the nerves are stretched to breaking-point, and the soul is overwhelmed in doubt and despair, it is a relief to fancy that the whole thing is one gigantic burlesque, a Gilbert and Sullivan Comic Opera, and divorced from all sense of responsibility to watch a performance whose absurdity is more mirth-provoking than the Mikado or the Pirates of Penzance. Yet even to mirth there must be a limit, and none better could be found than the words of the charming Elizabeth Bennett ¹ “I hope I never ridicule what is wise or good. Follies and nonsense, whims and inconsistencies, *do* divert me, I own, and I laugh at them whenever I can.”

In conclusion I must acknowledge my indebtedness to S. Nau Nihal Singh of Mananwala, Sheikhpura district, for his photos of the scene of the massacre at Nankana and also to my late confidential clerk M. Muzaffar Hussain for much miscellaneous assistance. It is perhaps hardly necessary to add that I alone am responsible for the facts and opinions given in this book, and that Government has had no concern in its publication whatever.

(¹) Jane Austen, *Pride and Prejudice*, Chap. XI.



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CHAPTER I.

WESTERN THEORIES AND EASTERN PRACTICE.

1.—THE MAKING OF THE PUNJAB.

Rusticorum mascula militum
Proles

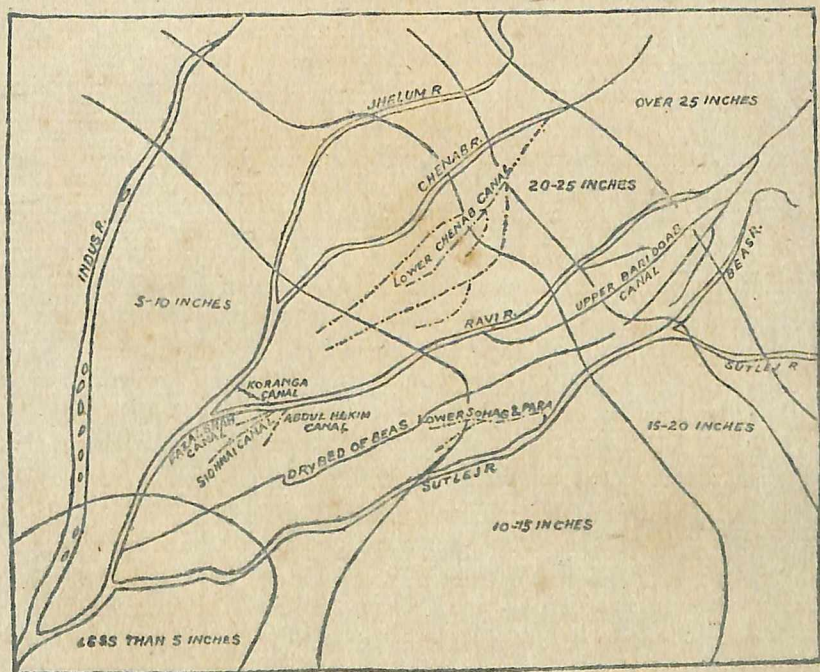
HORACE : *Odes. III, 6.*

The importance of the Punjab in the history and economics of the great sub-continent of The Land of the Five Rivers. India is out of all proportion to its population, its productive capacity, or even its size. Through it lies the only practicable highway between the nomad breeding grounds of Central Asia and the rich and fertile valley of the Ganges; with the result that like Palestine and Belgium it has been the arena of conflict between political systems far greater than itself. Occupying the angle where the Himalayas, which shut in the Indian peninsula to the north, meet the Sulaiman Range which bounds it on the west, and lying between Hindustan and the passes by which alone access is possible from the great plain of Central Asia, the Punjab and the North-West Frontier Province guard the gateway of that Empire of which they were the last portion to be won. Even the climate smacks of Central Asia as well as India. The bracing winter, which can hardly be rivalled outside the Riviera, more than atones for a hot weather which is one of the worst in India outside Sind. The inland position of the Province, combined with the sandy nature of its soil, gives rise to great extremes of temperature. In the cold weather, hot days are followed by cold nights; and the winter of a temperate climate is followed by a more than tropical hot weather. Such a climate breeds a hardy martial race, and the War found the Punjab peasant equally capable of enduring a winter in the mud of Flanders, or a summer amidst the sands of Mesopotamia.



But the dryness of the climate renders the question of rainfall all-important. About the end of July, when the rains of the monsoon reach the Punjab, they are considerably diminished in intensity, and though the hills get copious, and the submontane regions ample, rain, the amount which reaches the central districts is always less, and often insufficient for the maturing of the summer harvest and the sowing of winter crops. The condition of the west and south-west of the Province is still more precarious. The Himalayas, on the other hand, where moisture is nearly always available in the soil, are covered with valuable forests. But the seismic forces, which elevated them within a (geologically) recent period, are still in operation, and have recently given rise to a series of destructive earthquakes. And these, combined with the difficulties of communication in a region of mountain and ravine, have hitherto prevented the development of the economic possibilities of this well-watered area, and have rendered it a haven of refuge for indigenous races and primitive customs. This racial backwater is sheltered by the heights of the almost inaccessible Tibetan plateau, and only the apex and the western side of the triangle of the Punjab are pierced by passes practicable for army or caravan.

To the south of, and running parallel with, the snowy mountain ridge of the Himalayas, runs the low range of the Siwaliks, separated from the mountain range by a series of valleys. From a height of about 5,000 feet in the east below Simla they gradually fade away towards the north. At their feet lies the submontane tract, varying from one hundred to two hundred miles in breadth, which has always been fertile and habitable and has for centuries served as a highway for invaders from the north. Diminishing in height towards the north, the Siwalik range increases in breadth till it finally extends over the whole north-west corner of the Province between the Himalayas and the Frontier hills. Here the soil consists of disintegrated Siwalik sandstone, differing widely in appearance and agricultural quality from the alluvium of the true Punjab plains. Between this rocky area and the alluvial



I.—Sketch map of Punjab showing rainfall contours.

Note.—There is ample rain in the submontane regions to the North-West, insufficient in the Central Punjab, and practically none to the South-East.



THE MAKING OF THE PUNJAB

plains rise the gaunt outlines of the Salt Range which, time-worn though it has become through the waste of ages, still rises at the small modern hill station of Sakesar, its western extremity, to a height of 5,000 feet.

But the real Punjab lies in the plains watered by the five rivers from which it takes its name. The gradual slope of the plains to the south-west, seldom exceeding two feet in a mile, determines the course of the rivers. In the process of time each stream has cut for itself a wide valley, which lies well below the level of the plain, and whose banks mark the extreme limits of the river's course on either side. Within this valley the stream meanders in a narrow but ill-defined and ever shifting channel. In the winter the volume of water passing is comparatively small; but as the mountain snows melt at the approach of the hot season the rivers rise and overflow the surrounding country, often to a distant several miles on either side. At the close of the rainy season, the waters abate, leaving wide expanses of fertile loam or less fertile sand. Beyond this flooded area, the land is still comparatively low in level, and moistened by percolation, so that wells, often mere holes in the ground, can be dug, and water found at a depth of from seven to twenty feet. This area is easily cultivated, but does not give the best results, owing to the prevalence of saltpetre in the soil and the washing away of important soil constituents. Further from the river, the soil is better and the country healthier. Wells are still freely sunk, but a masonry lining is generally necessary, and the labour of cultivation is much greater. The uplands between the rivers are now gradually being rendered the most fertile tracts of the Province by a series of great irrigation works. Previously, however, they were desolate tracts only fit for grazing.¹

Necessity for water confined the early agriculture The Village of the Punjab to the sub-montane area and Community. the river valleys, tracts which in primitive times were probably more extensive than to-day. This agriculture, based mainly on wheat, bred up a manlier

¹ *LFR* pp xv—11.



race than the rice-fed populations of Bengal and South India, and one whose hardiness was accentuated by the rigour of the climate and the invasion of hardy nomad races from Central and Western Asia. These nomads were organised in clans united by the ties of real or fictitious kindred on the quasi-military patriarchal system. They imposed its organisation on the Village Community of the early agriculturists, and so gave it a strength and coherence which was hardly attained anywhere else in the world, and a form, which in spite of many vicissitudes it still, in essentials, retains. The conquering clansmen constituted a strong joint body, generally claiming descent from a single head, which, while jealously insisting on equality amongst its members, maintained its superiority over the original inhabitants. These latter were reduced to the position of tenants and servants to the conquerors and became the village menials. Still lower classes of menials were recruited from the wandering aboriginal tribes, who did not disdain the lowly tasks of scavenging, tanning and weaving and who, for a share of grain at harvest wove the coarse cotton clothes and cobbled the shoes of the cultivators.

For ninety per cent. of the population all interest social, political and economic was bounded by the village. The grave dignified procedure of the Committee of Elders, the more unconventional methods of the village assembly, occasional difficulties with the tenants or menials, these formed the normal politics of the self-sufficing village. More exciting were the petty wars with neighbouring villages, in the conduct of which alliances, leagues and hegemonies were formed, from which a Punjab Aristotle might have obtained material for a discussion on the politics of the Village Community. In the main, however, custom ruled—a custom which regulated life and conduct, and though it hindered rapid innovation, yet secured that the experience gained by each generation was handed down to the next. And the necessity of a rigid adherence to custom in his greatest occupation tended to impress on the cultivator the undesirability of change in any sphere of his life, and to



render him the bulwark of tradition and conservatism. Occasionally a nightmare would burst in on the happy little life of the Village Community,—a fell disease, an invading tribe, an army on the march, a King or a royal official who refused to be satisfied with a reasonable share of grain. More destructive still were the nomad invasions from Central Asia, which nevertheless repeatedly reseeded the Punjab with vigorous stocks.¹

Of these early invaders, the best known are the Aryans, the majority of whom settled in the Punjab. But the institutions which are generally associated with them—the Hindu kingship with its Brahmin advisers—developed in the Ganges valley to the east; and their influence over the Punjab was far less than over the rest of India. The early Hindu kings derived most of their revenue from the land, about a quarter of its produce coming to them as their share, the amount being measured on the threshing floor by village accountants and collected in kind by village headmen. The spread of the “Aryan” kingship into the Punjab was, however, hindered by further invasions of nomad Scythians and by the growth of Buddhism. But Buddhism decayed and a new and more popular form of Hinduism arose with the Brahmin-dominated caste system and the ritual legalism which have characterised it ever since. The popular cults of the pre-Aryan Dravidians were co-ordinated with the less ritualistic religion of the nature deities of the Aryans, a transformation which has its parallel in the Greece of the end of the classical period when the ‘reasonable’ cult of the Olympian divinities was superseded in many serious minds by the more ‘religious’ mystery rites; and in Ezekiel’s incorporation of old Semitic rites into the Jewish Church, at the sametime giving them a new symbolic value.² But in the Punjab this type of Hinduism was strongest in the towns and amongst the literary classes. In the villages

¹ P.A.R. 156 : L.F.R. 11-28.

² Nairne. The Faith of the Old Testament (Longman, Green and Co. 1923).

tribal feeling remained powerful, with its joint ownership of the village, its respect for military prowess rather than ceremonial sanctity, and its customary law, which owed more to primitive nomad morality than to Brahmin innovation. The Scythian invaders became gradually differentiated into the great tribes of Jats and Gujars according as they abandoned or retained their nomad characteristics; while in areas where the Hindu kingship prevailed the Rajput clans were made up of those who could trace kingship with present or past rulers.¹

In a sense the Muhammadan invasions were merely The sword a repetition of the nomad inroads which had of Islam. preceded them. But they were a repetition with a difference, and that difference was a vital one. The older invaders had allowed themselves to be absorbed into the Brahmin system, whose caste prejudices were fatal to military efficiency. And though Brahminical influence was weaker, and nomad tribal tradition stronger, in the Punjab villages, yet even there the Hindu system for the most part prevailed. But the Muhammadan invaders brought with them a faith that allowed of no compromise with Brahmin tenets. To the caste system it opposed the equality of all believers, and the inferiority of all others, whether Brahmins or Non-Brahmins; to cow-worship it opposed cow-sacrifice, to an army graded on caste principles one in which each private carried a Marshal's baton in his knapsack; above all to a medley of conflicting gods all acting at cross purposes, it opposed belief in one God whose law was righteousness.

Politically however Islam introduced no new principle. The Muhammadan kingdoms, and in particular the Moghul Empire, were moulded on the usual lines of Oriental (and in particular Hindu) monarchies. Political theories were simple, the chief preoccupations of the government being the collection of revenue, and the maintenance of an army. These two primary functions were largely in the hands of a single set of officers, who also discharged most of the remaining

¹ I.F.R. 29-90.

duties, and in particular were responsible for the maintenance of internal peace. The foundation of the Mogul administrative system lay in the division of its territories into provinces,¹ which were sub-divided into districts², the district being subdivided into subdivisions.³ The Muhammadan rulers systematised the land revenue procedure of their Hindu predecessors, though they were less restrained in their demands from subjects whom they regarded as infidels. A radical modification was introduced with Akbar's cash assessment, under which the State took a lump sum from each holding instead of a share of the produce. But this system was too complicated. It necessitated the employment of a large staff of subordinate officials who toured about measuring the cultivated land and "assessing" the cash sums payable. After Akbar's death these officials got out of control, and the "assessments" were gradually abandoned, it being more satisfactory for all parties to agree to a lump sum, payable by the village and for which the headmen were responsible. As the Mogul Empire became more unwieldly in size and less efficient in administration, larger and larger areas were granted out to revenue Farmers, who became responsible for the land revenue, which they themselves recovered from the villagers. This system lent itself to extortion, and did much to prepare the way for the collapse of the Empire, a collapse which was hastened by the fervid monotheism of Aurangzeb, to whose influence must however mainly be attributed the conversion to Islam of nearly all the agricultural tribes of the Western Punjab and many of other parts.⁴

But just as the militancy of early Islam had provoked The rise of Christendom into the re-action of the Crusades, so the persecuting spirit inaugurated by Aurangzeb evoked a bellicose spirit amongst the Mahratta peasantry of the Dekhan and turned a quietist

¹ *Suba*, about half the size of a Province of the British Indian Empire.

² *Sarkar*, about twice the size of a modern district.

³ *Mahal*, about half the size of a modern tahsil.

⁴ *LEF* 91-138.

of Hindu monotheists in the Punjab into the Church Militant of the Sikhs. Like the Founder of Christianity, Baba Nanak, the originator of Sikhism was more concerned to win over his followers to a life of righteousness than to denounce other religions. The Pharisaical legalism, the idolatry, and the caste system which characterised Brahminism he did denounce, not because they were Hindu, but because they were unrighteous. Like Christ, moreover, he distinguished righteousness from asceticism, and it was in disregard of his teaching that his son became an ascetic and founded the Udasi sect of recluses, who renounced the world and domestic life. The Udisis were however excommunicated by Amar Das, the third Sikh Guru, ¹ who recalled his followers to the mildness and tolerance of Nanak. But Arjan, the fifth Guru, plunged into the stormy sea of politics, and so effected a permanent cleavage between the two monotheistic faiths of Sikhism and Islam. The breach was widened by the persecutions of Aurangzeb.

The reaction came under the last and greatest Guru, Govind Singh. He it was who first conceived the idea of forming the Sikhs into a religious and military commonwealth; and he executed his design in the systematic spirit of the Spartan Lycurgus. Under him the organization which had sprung into existence as a quietist sect of a purely religious nature, and had become a military society of by no means high character, developed into the political organization which was to rule the whole of North-Western India, and to furnish to the British arms their stoutest and most worthy oponents. Denominating his followers the Khalsa, the "pure", the "elect", the "liberated" he openly attacked the distinctions of caste, and taught the equality of all men who would join him. Instituting a ceremony of initiation, he proclaimed it the "gate" by which all might enter the society, while he gave to its members the communion as a sacrament of union in which

¹ *Guru* = teacher, was the title given to the first ten successive spiritual Heads of the Sikh church.



the four castes should eat of one dish. The higher castes murmured and many of them left him, for he taught that the Brahmin's thread must be broken; but the agricultural classes and the lower orders rejoiced and flocked in numbers to his standard. These he inspired with military ardour, with the hope of social freedom and of national independence, and with abhorrence of the hated Muhammadan. He gave them outward signs of their faith in the unshorn hair¹ the short drawers and the blue dress; he marked the military nature of their calling by the title of "Singh" or "lion", by the wearing of steel and by the initiation by sprinkling of water with a two-edged dagger, and he gave them a feeling of personal superiority in their abstinence from the unclean tobacco. His religious creed was in many respects much the same as that of Nanak; the God, the Guru, and the Granth² remained unchanged. But while Nanak had substituted holiness of life for vain ceremonies, Govind Singh demanded brave deeds and zealous devotion to the cause as the proof of faith; and though he retained the tolerance which his predecessor had extended to the Hindu gods and worship, and indeed showed a marked inclination in their favour, he preached undying hatred against the Muhammadan persecutors. Though alienated from orthodox Hinduism by a democratic spirit which repelled the exclusive Brahmins and Rajputs, the military organization of the Sikhs was now consecrated to a long and eventually successful struggle with Islam. At the end of the struggle the quasi-tribal democratic Sikh leagues were consolidated by the genius of Ranjit Singh into a strong Sikh kingdom, whose administrative methods were modelled on those of the Moguls, though the Sikhs preferred

¹ The characteristic of the Hebrew Nazirites of whom Samson was the typical example; men self consecrated to Jehovah, and hostile to alien domination and customs, who in token of their vow wore their hair unshorn. (Cf Ottley, *Religion of Israel* Cambridge University Press, pp. 45, 55). Govind Singh systematised and utilised an Eastern ritual of unknown antiquity. Incidentally long hair was a great protection against sword cuts, and sharply differentiated Sikhs from others. It took two or three years to grow the hair long.

² The Sikh Bible.

to deal direct with the Village Communities rather than through intermediaries who might grow too powerful¹.

But the British limited Sikh expansion eastwards. The Sikhs and Ranjit Singh, thus headed off from the British. Delhi, turned his conquering energies upon the Muhammadan States north and west of Lahore. He continued to push his dominion to, and even beyond, the Indus, till further progress was arrested by the wild highlands of the Frontier with their still wilder inhabitants². Beyond these lay Afghanistan, and still further beyond lay the plains of Bactria, which had been wantonly desolated by wars, by the tyrannical despotism of the native rulers, and above all by the depredations inflicted by reckless Turcoman robbers. But the political obstacles to a Russian invasion did not deter the British from adopting "a 'forward policy' which would counter the supposed Russian designs by an advance on Herat, and simultaneously establish on the throne of Kabul a sovereign friendly to the British," however uncongenial he might be to his own subjects. "A British Indian army, leaving on its flanks the hostile Amirs of Sind and the suspicious and truculent Sikh Sirdars, crossed the Indus and penetrated the barren defiles of the Border hills, and, with a line of communications extending to hundreds of miles, reached its objectives, escaping starvation by a miracle. For a time the policy seemed to have succeeded; in the end its costly failure was all the more tragic;" the tragedy being enhanced by the fact "that no single Russian soldier quitted his far-distant cantonment to help bring it about³." The loss of prestige incurred by this failure did much to excite the Sikhs against the unsuccessfully aggressive British; but the political wisdom of Ranjit Singh died with him. Yet even under his stupid successors the Sikhs only succumbed after making a stouter resistance than the British had experienced elsewhere in India⁴.

¹ LFR 164-89.

² Thorburn PPW 286.

³ NC (August 1927) 212.

⁴ LFR 189-212.



2.—THE PUNJAB UNDER THE BRITISH.

Ill fares the land, to hastening ills a prey,
Where wealth accumulates and men decay.
Princes and lords may flourish, or may fade,
A breath can make them, as a breath has made,
But a bold peasantry, their country's pride,
When once destroyed, can never be supplied.

GOLDSMITH : *The Deserted Village.*

✓ On the annexation of the Punjab in 1849, a Board of Administration was constituted for its government. Differences of opinion arose in the Board and as might have been expected, it was found that the responsible executive functions in a province could not safely be entrusted to a Trinity that was never at unity in itself. The Board was accordingly abolished in 1853, its powers and functions being vested in John Lawrence as Chief Commissioner. The reconciliation of the Sikhs to the new regime was due partly to tactful handling, but still more to the political sagacity of the Sikhs themselves, who appeared to have made up their mind to accept their beating as final, and to rise to wealth and honour under a race, whose power and worth they had already begun to realize. The Muhammadan peasantry of the West, on the other hand, had learned to appreciate its freedom from Sikh oppression, and had not yet come under the more humiliating domination of the lawyer and the money-lender.¹ Across the Indus except for part of the Peshawar valley, "the Sikh supremacy had not been that of a settled government, but of a marauding organization, whose forces periodically swept through the country, nominally collecting arrears of revenue but really consuming or carrying off what was portable, and destroying what was not." After annexation the British took more effective possession. To the vindictive Pathan tribesman of the Frontier internal peace had been unknown except when they all combined against a common enemy. Yet they readily settled down under the

¹ L.F.R. 213-5.

firm though mild-mannered rulers who lived in their midst and devoted all their energies to the welfare of their charges.¹ Consequently, when the crisis of the Mutiny arose, John Lawrence was able to marshal a practically united Punjab against the Mutineer.² Specially conspicuous were the loyalty and valour of the levies raised from the Frontier districts; and the feeling that in sentiment and interest the Frontier had proved itself one with the Punjab was so strong that all talk of its severance was dropped for twenty years.³

The Village Community under British rule. The disintegrating forces exerted by the highly centralized European State on all smaller social organisms had long ago destroyed the Village Community of the West, and the same tendency was soon evident in India, accentuated as it was there by the perverted application of English legal theories to a social system from which they were wholly alien.⁴ In the Central and Eastern Punjab the villages were still built on traditional lines, the houses of the members of the brotherhood and their dependents being erected close together,⁵ those of the village menials being usually placed on the outskirts, while the inferior castes sometimes dwelt on separate sites at a little distance.⁶ Such villages were often divided into separate parts,⁷ which were themselves sometimes again subdivided.⁸ In the south-east of the Province the proprietary body of each village or subdivision of a village claimed to be kinsfolk, their rights in the common land being measured by ancestral shares. Further to the north-west, the communities were often much less homogeneous, and whatever may have been the original form of land-holding "under the Sikhs the land in each man's possession had come" to be recognized as the measure of his liabilities, and also of his right in any common pro-

¹ Thorburn *P.P.W.* 287.

² *L.F.R.* 215-9.

³ Thorburn *P.P.W.* 289-90.

⁴ Jenks 139 *L.F.R.* 279-307.

⁵ Abadi.

⁶ *S.M.* 131.

⁷ Taraf, Patti or Pana.

⁸ Into Thoks or Thulas *S.M.* 148.

perty or profits.¹ "But the British land revenue officers having learnt to base their land system on the Village Community in the Gangetic plain, artificially extended the conception to tracts where it had no natural existence." Thus in the Simla hills and in the more mountainous portions of the Kangra district village communities were created by the combination "of numerous small hamlets, each with its own group of fields and separate lands, which had no bond of union until they were united for administrative purposes at the time of the land revenue settlement. In the south-western districts again, while regular village communities were frequently found in the fertile lands fringing the rivers, all trace of these disappeared where the cultivation was dependent on scattered wells beyond the immediate influence of the river. Here the well was the true unit of property, but where the proprietors of several wells, were sufficiently close together to be conveniently included within one village boundary, the opportunity was taken to group them into village communities²."

From the point of view of the British land revenue authorities the Village Community consisted of a group of proprietors, owning part of the village lands in common and being jointly responsible for the payment of the land revenue. This joint responsibility was made a prominent feature of village tenure by the British, though it occupied a far more prominent position in their codes than in their practice³. The communal body had no legal powers, though it lay in its power to inflict on the recalcitrant—social ex-communication in the case of members of the community, and various inconveniences in the case of menials and artizans. But under the English legal system the village money-lender soon escaped from its authority, and, by virtue of being the creditor of every man in the village, became able to exert considerable pressure on the informal village council, which formerly managed the affairs of the brotherhood⁴.

¹ S. M. 148.

² PAR 156, Gazetteer 122-3.

³ S. M. 126, 132.

⁴ Panchayat.

This council however "was too numerous and loosely constructed to fittingly represent the community in its dealings with Government officials. A few of the leading members were, therefore, selected as headmen¹ and the appointment of headman naturally came to be confined to particular families." From a revenue point of view the most important duty of the headmen was to collect the land revenue from the landowners and pay it into the treasury. But the special position assigned to the headmen and the disintegrating influence of the English legal system soon stripped the village council of its influence. All the business of the community was transacted by the headman; and this included the management of its common fund², to which all had to contribute, and to supplement which, in many villages, a hearth or door tax was imposed on all residents who were not members of the proprietary brotherhood³. As a result the headmen began to presume on their position, and, acting in league with a few of the larger and wealthier shareholders, often exploited the rest to their own advantage. In the northern Punjab the dissolution of the communal tie was marked by the growth of a party spirit which was often the cause of lawless affrays and murders⁴.

"The admission of strangers into the brotherhood was always, in theory at least, a thing to be guarded against, and village customs in the matter of inheritance and pre-emption are founded on this feeling. But under native rule the repugnance to admit strangers often yielded to the pressure of the Government land revenue demand, and outsiders were allowed to share in rights which had become burdens. The almost complete freedom of transfer for long enjoyed in practice under British rule had a still more disintegrating effect on village communities." Generally the tendency of British administration and still more of the English legal system was "to loosen the communal tie and to weaken the authority exercised

¹ *Lambardar*, a corruption of numberdar, i.e., a representative of the proprietary body, who has a number in the Deputy Commissioner's register of persons responsible for the payment of land revenue.

² *Malha*,

³ *S. M.*, 93, 96, 129 *Gazetteer* 123.

⁴ *Baden Powell*, 437.

by the proprietary body over its individual members and over the other inhabitants of the village.”¹

The Frontier was less subjected to the demoralising influences. In Baluchistan on the south the administration was conducted through the agency of the tribal Chiefs,² “whose position among a people of marked feudal traditions has always been stronger than that of the Khans of the more democratic Pathans”³ to the north. “Except for the Peshawar valley, the system of border defence was uniform all down the frontier.” Strong block-houses were built at intervals guarding the British and of the chief passes leading into the hills, and these were connected by a bridle road and a line of small defensible posts or towers. For nearly thirty years after annexation, except in and about Peshawar, along six hundred miles of wild borderland the hill-tribes never saw a British soldier; yet they never caused the villagers in British territory as much material damage as the robber gangs which so often wandered unchecked near the centres of law and order.⁴ The Frontier would have remained quiet enough had it been let alone, but fear of Russia dominated the policy of the Government of India.⁵ Consequently, a large garrison was maintained in the Peshawar valley, directly under the orders of the Commander-in-Chief; it being apparently thought that the best protection against Russia was to irritate the Afghans and the frontier tribes. Finally, under Lord Lytton,⁶ “the inevitable ensued, hostilities with both; and in 1878 in spite of famine, deficits, and falling rupee, the grasping politicians then in power, whilst endeavouring to obtain a ‘scientific frontier’—that mirage of a disordered imagination—and force a protectorate upon the Amir of Afghanistan, plunged into a protracted war with that country, and emerged from it two years afterwards the poorer by 25 millions sterling, the richer by a few square miles

¹ S.M. 127, 130, L.S. B.I. Vol. I, 169.

² Tumandar.

³ O'Dwyer 124-5.

⁴ Thornburn P.P.W. 291-4.

⁵ P.A.R. 32.

Viceroy from 1876 to 1880.

of worthless territory.”¹ It then became clear that it would have been better to have strengthened the British lines of defence in India, before advancing into space outside her limits. For thirty years the work had been neglected, though the money wasted in Afghanistan would have been more than sufficient to complete it. “But, as man is constituted, entrenched positions, roads, railways, bridges, and telegraph lines are poor equivalents for war, which gives ambition scope, whilst spade work does not. When, after the madness of war, the imminent insolvency of India enforced a return to common-sense, the railway was only open to Jhelum, the Indus was nowhere bridged, and beyond it from Peshawar to Sindh communications were almost in the same embryonic condition as they had been in 1849. By 1890 so vigorously had road and railway making been pushed during the preceding ten years that, except for Bannu, reinforcements could be concentrated at any point upon India’s Ultima Thule almost as rapidly as was the case for any interior station.”

The system which had given the Punjab Lieutenant-Governor political control over the Indian Frontier was justified by the fundamental principles underlying all frontier administration. The fluctuating jurisdictions, which must necessarily characterise political insecurity, render impossible that regime of rules and regulations which accompanies continuity and security in administration. The generals on the borders of the Roman Empire were left unfettered; the guardianship of the eastern marches of the Holy Roman Empire was freely entrusted to Prussia and Austria; and even the centralized Government of Mediæval England left semi-independent Lords Marcher on the Scotch and Welsh Borders. But the very efficiency, which such a delegation of authority ensured against the enemy, was equally effective against the power from which the authority was derived. The Roman generals often turned from fighting against the hardy barbarians beyond the Rhine and the Danube to the easier task of plundering the effeminate population behind.

¹ Thorburn P.P.W. 296.

them. The Holy Roman Empire was devoured by Prussia and Austria who had been designed as its guardians, while the English Lords Marcher after fomenting rebellion after rebellion against the Plantagenets, finally plunged the whole kingdom into the suicidal strife of the Wars of the Roses. But the Punjab Lieutenant-Governor could have neither the fiery spirit, nor the reckless disloyalty of a Hotspur, and the curtailment of his powers was due rather to the Viceroy's contempt for his ignorance of "imperial considerations" and "the larger problems of foreign policy," than to any fear of his becoming too powerful ¹.

Communications with the Viceregal Court at Calcutta were too slow and too liable to long interruptions to enable the Viceroy to exercise effective supervision over the political officers on the Frontier; consequently with the curtailment of the authority of the Punjab Lieutenant-Governor, each of these young officials became himself a petty Lord Marcher. One such official, named Mortimer Durand, won honours and rewards from an agreement with Afghanistan which gave the Amir an increased subsidy and the British the barren right of delimiting the frontier by the erection of cairns in tribal territory ². This last privilege gave political officers every excuse for a policy of adventure, and it was not long before a fire-eater named Dr. Robertson had succeeded in pledging the honour of England to the backing of an unsatisfactory pretender to the throne of Chitral. "A business-like Government, before plunging into a policy of adventure amidst independent Moslem communities all up and down a long frontier, and in the case of Chitral 150 miles beyond it, would have counted the cost and prepared plans to meet the probable consequences of its rashness. But Lord Elgin ³ and those in his confidence had thought out nothing; having informed the Secretary of State for India of the risks of simultaneous forward moves

¹ Thorburn P. P. W. 299, 344.

² Thorburn P. P. W. 300-6; P. A. R. 32.

³ Viceroy from 1894 to 1899.

along the whole north-west frontier of India, they appear to have washed their hands of the consequences, and to have considered that their duty and responsibilities began and ended in blindly executing the supposed 'mandate' to carry out the "Durand agreement." The relief of Chitral, where Dr. Robertson and his pretender were besieged, was ultimately effected, though not without difficulty, but the knighthood which was afterwards bestowed on this king-maker stimulated every political officer to acquire a name for himself by stirring up friction on the Frontier¹.

Fortunately for the British, "tribes rose successively in local groupings, each forming a detached Nemesis 1897. self-contained aggregate of little democracies, only connected with its neighbours by a common religion; combined synchronous action was hardly possible for them." From Chitral the unrest spread south to the Swat valley, thence further south to the Mohmands, till finally even the pre-British Afridis were affected. As good Muhammadans "and the premier fighting clans of the borderlands, duty and honour bound them to start a row of their own; besides the general delimitation grievance, they had their own special causes of complaint, by showing their teeth they might get a few knocks—in time,—but eventually they would be gainers from larger subsidies, better service-terms, and increased respect from" the British and their neighbours as well. "Whilst the fermentation was rising in the hills over-looking Peshawar, down in the valley the chief local authorities, the Commissioner and the Brigadiers, no plan of action having been pre-arranged, were sitting in their darkened office-rooms in constant communication with each other with those whom duty kept in the Khyber or at any of the outposts, and with their respective official superiors recessing in the Himalayas, the Lieutenant-General commanding the Punjab army corps at Murree, and the heads of the Imperial hierarchy at Simla, the Viceroy in Council the Commander-in-Chief and the Lieutenant-Governor of the Punjab. Meanwhile precious time was being wasted; the

¹ Thorburn P. P. W. 309-12, 315-6. Smith India 767.

five authorities, or six, if the Viceroy's Executive Council be included, amongst whom the decision lay, discussed points by wire, letter, and minute, noting, questioning, surmising, arguing, suggesting, doing everything, in short, but acting, each shirking responsibility, and waiting on one of the others to take the bit in his teeth and say the pass must be held, otherwise, if we vacillated longer, we should not only lose it but our honour as well. In a multitude of counsellors there may be wisdom, but there is certainly weakness and the wisdom, as a rule, shows itself too late." The British race was still the same, "self-reliant, audacious, determined; but its men in authority were degenerates, desk-tied, vacillating, fearful, shirkers of responsibility, scribblers and talkers, not doers." While their deliberations proceeded, the Afridis rushed the forts commanding the Khaibar pass, and the British were left to retrieve their honour by the undertaking of war against them on a large scale.¹

“For the third time since 1894, the other occasions being Chitral in 1895 and Swat three months previously, the civil executive of the Punjab was converted into a vast organism for the impressment of transport to meet the military requirements of the hour. By law impressment had always been criminal; yet for all purposes great or small from a military expedition to the annual reliefs or the cold weather tour of a Commissioner, it had been the only means by which the official requirements of peace or war could be satisfied. For peace movements inside India the people bore commandeering without a murmur; forced labour had always been exacted from them, only professional carriers were taken, and for short distances and periods, and the hire was liberal. But impressment on a large scale for war purposes outside India was unknown before the Afghan wars, and external campaigns had not been previously undertaken. In 1838-42 the people had been ignorant of better things and were submissive as slaves; in 1878-80 they had some knowledge of their rights, and since then, repeated

Pressgang
 operations in
 the Punjab
 villages.

lessons and the omnipotence of law and lawyers had taught many of them sophistication. In 1878, during the first phase of the campaign in Afghanistan, the Punjabis had lost, from starvation, cold and general neglect, 80,000 camels and other animals, and un-ascertained numbers of drivers. The sufferings then endured had so impressed owners with the risks and horrors of service trans-Indus that, without compulsion, transport of any kind had never since been procurable. As a consequence, whenever an expedition took place, the Punjab Government—inducements to voluntarism having failed—had been constrained to seize wholesale not only baggage-animals but their owners as well, and as the work was a penal offence it had never been regulated; hence it was done haphazard without discrimination or organisation. So long as only camels and their owners were requisitioned, the routine of village life was undisturbed; but when, as for Chitral and Swat, fully equipped carts, ponies, mules, pack-bullocks, and even donkeys were swept up from all parts of the Province, driven to distant depots, weeded there, and the fit residue taken for service, the patience of the many-burdened peasantry was sorely tried; for every family was a sufferer, arrangements for marketing and the distribution of food being dislocated. Thus, besides the hardships to individual owners, the whole rural economy of the Province was thrown out of gear, and the Government, compelled to break its own law, had to stoop to the official subterfuge of concealing its wrong doings by softening the terms seizure and impressment into 'hiring' or 'assistance rendered by civil officers to the Commissariat Transport Department.' To meet the military demands in the emergencies of 1897 the civil power collected roughly 160,000 animals and carts and 40,000 attendants; but eventually less than one-fourth of these numbers were pronounced fit and sent to the front.¹

The Afridi victories roused the Muhammadan villagers of the western Punjab from the condition of hopeless apathy into which they had fallen since the English legal system had enslaved them to the money-lender. "They threw off much of their

¹ L.A.M. 821; Thorburn P.P.W. 227-30.



characteristic apathy, moved alertly, talked loudly, prayed less negligently and less irregularly, discussed politics less incuriously, and entertained less grudgingly those propagators of lies and treason, wandering *faqirs* and holy men." But their hopes were vain. The Afridis could not resist the machinery of civilisation, once its cumbrous apparatus was set in motion. Their valleys, until then unexplored, were penetrated, and the active resistance of the clans broken. The Afridis themselves were anxious for a peace, which the British were only too happy to give them; and thus a war, which could have easily been avoided, ended in what amounted to a stalemate.¹

The tribes soon found that, as anticipated, they had done well in resisting their virtual annexation; for not only had they gained their immediate object, but their strength and unanimity were forcing the British to reconsider their whole frontier policy. "No sooner was Lord Curzon installed as Viceroy,² than financial and military exigencies constrained him to advise and inaugurate a complete reversal of the practice initiated by his two predecessors of segregating Indian troops in negligible localities off the two only important lines of land-communication between Indian and Central Asia, the Bolan and Khaibar routes. Unable to wholly withdraw from the false positions already occupied, Lord Curzon fell back on the old Punjab system of endeavouring to enlist the goodwill of the tribes themselves in the cause of order and border defence by making it worth their while to behave as friendly neighbours and protect their own caravan routes. Having the resources of the Empire at his disposal, he was able to be more thorough than the provincial government, with its narrow means, had ever been. Instead of employing levies, i. e., undisciplined and ununiformed tribesmen under their own headmen, he converted the raw material in each locality into a militia, by organising levies into local regiments each under British Officers. The new departure

¹ *Smith India* 787. ² January 1899.

Thorburn P.P.W. 330-6.



or rather development of the old Punjab system, economised troops and money, enriched the tribes and placated their susceptibilities. In a sense a step backwards it was nevertheless politically and financially a stride in the direction of business-mindedness, until then for many years a stranger to Viceregal counsels.¹

Having reverted to the old Punjab system it would have been a graceful act on the part of Lord Curzon and Sir W. Macworth Young. Curzon to have acknowledged his obligation to the Punjab Government. Instead of that he proceeded to carry out the separation of the frontier districts from the Punjab in a manner that was painfully galling to the Lieutenant-Governor of that Province,² Sir W. Macworth Young, a man of charming personality and acute intellect, "who had served in almost every executive, administrative, and secretarial office, and had also had experience of the Government of India and of the Political Department." Lord Curzon's object was to bring the Frontier districts, "under the direct control of a Chief Commissioner at Peshawar, directly subordinate to the Foreign Department of the Government of India. In a Minute of characteristic vigour and cogency he pointed out that the Punjab Government was called upon to carry out a Frontier policy for which it was not in the last resort responsible and with which it was not specially qualified to deal; while the Government of India was responsible for a Frontier policy that was not carried on by its own agents—and was to a large extent removed from its direct supervision. Labour without responsibility was the experience of the Punjab Government; responsibility without control that of the Government of India. The project for separating the Frontier areas from the Punjab, and bringing them under the direct control of the Government of India, was outlined in Lord Curzon's Minute in great detail. It was sanctioned, in principle by the Secretary of State at the end of 1900 without any previous reference to the Punjab Government.

¹ Thorburn P.P.W. 340-1.

² 1897-1902. A list of the Punjab Lieutenant-Governors, and Governors is given in Appendix I.

This was, not unnaturally, resented as a slight to a Government which for over fifty years had borne (and not unsuccessfully having regard to the very difficult conditions) the brunt of Frontier administration. The skilful dialectics which Lord Curzon used to establish his case were regarded in the Punjab as savouring rather of the brilliant advocate than of the impartial statesman, and his imputing the blame for past blunders to the Punjab Government and its methods caused further irritation to an Administration which was both proud and sensitive."¹

The ultimate result of all this pother was that the Punjab lost all its territory to the west of the Indus, with the exception of the small *tahsil*² Isa Khel, whose inhabitants were particularly loud in their protests against their transfer, and the Dera Ghazi Khan district to the south, on the borders of Baluchistan.³ Here political control over the Frontier tribes had been entrusted to the Commissioner of the Derajat⁴ who was sufficiently in touch with the border to manage it effectively, unhampered as he was by interference from the Government of India. This harmonious state of things was therefore allowed to remain undisturbed.⁵

The advantages to be gained by "fixing personal responsibility, facilitating the rapid transaction of business, and detaching Pathan districts from the 'complex paraphernalia,'⁶ of the civil justice system of India were great." On the other hand, the Viceroy of the day, normally a man "who knew nothing about the frontier at all or about India, for that matter" was "deprived of his only expert and independent counsellor, the Lieutenant-Governor of the Punjab, an official who, whether with or without previous trans-Indus training had hitherto, for the previous thirty years or more, been necessarily conversant with frontier

¹ O'Dwyer 88-9, 104-5; Thorburn P.P.W. 343-4.

² Portion of a district, see para.

³ P.A.R. 33; *Smith India* 772; *S.M.* 14. Appendix II.

⁴ After the dismemberment, the Commissioner of Multan.

⁵ P.A.R. 32.

⁶ Lord Curzon's expression.



affairs and personally intimate with every officer, English and Indian, serving in the Pathan districts." There was moreover "an inevitable tendency in a small Frontier Province directly subordinate to the Foreign Department of the Government of India for officers to scamp the more humdrum duties and play to the political gallery." This ere long led "to inefficiency and a general down-grading of the standards of civil administration." Tedious enquiries into rights in land were neglected for "political" intrigues with the "Khans,"¹ intrigues in which the British tiro was invariably worsted by the more experienced Oriental; while the attention of the outside public was distracted from the growing insecurity which prevailed throughout the frontier by newspaper "stunts" in which hospital nurses figured prominently in rescue work, which would have been more fittingly performed by political officers.² Moreover, the new province was so constructed that administration must necessarily be difficult, as the natural lines of communication up the river valleys connected the different frontier districts with the Punjab rather than with each other. Even the name North-West Frontier Province was cumbrous, and necessitated the substitution of the meaningless title 'United Provinces' for the old 'North Western Provinces' with all its interesting historical associations.³

However defective its administration, the new creation had nevertheless saved the Frontier tribesman from the devitalising jurisdiction of the Punjab Chief Court, which was rapidly reducing the free Punjab peasant into a condition of praedial slavery to the money-lender. Debt had always been the curse of the agriculturist, forced as he was to borrow when harvests were bad. But British rule, by limiting the land revenue demand, gave the peasant a valuable proprietary right in his land, a right which the British legal system held to be transferable. Thus the peasant proprietor was now able to offer the money-lender a

¹ Pathan tribal chiefs.

² *O'Dwyer* 108-9; *Thorburn P.P.W.* 345, 347; *P.A.R.* 33.

³ *Smith India*, 772.



valuable security for debts, at a time when the new legal system was prepared to enforce the claims of the money-lender to the uttermost farthing. As a result the money lender, who had previously been a rather popular menial, became the hard griping usurious economic dictator of the village. These conditions were further "advanced" in Bombay, and serious riots in the Dekhan led in 1879 to the passing of a Relief Act, which created a special machinery for adjusting disputes between peasant and money-lender. The riots were followed by famine, and the Famine Commission of 1880 recommended the extension of the provisions of the Relief Act throughout India. The influence of the money-lending classes was however sufficiently strong to prevent this recommendation being given effect, and to blast the career of Thorburn, a brilliant Punjab official, who devoted his whole life to the cause of peasant emancipation in Punjab.¹

✓ But though Thorburn could not save himself, he saved others. "The fatal facility with which the agricultural tribes of the Punjab had got into the clutches of money-lenders, resulting in the course of time in the reduction in their status from proprietors to tenants," was now apparent to all; and the Russian scare, however foolish, did nevertheless serve the useful purpose of enhancing the political importance of the peasantry, who might be required as cannon-fodder in case of a Russian invasion. The ultimate outcome was the Punjab Alienation of Land Act, which limited the free transfer of landed property by those declared to be members of agricultural tribes. The agricultural tribes of each district were gazetted by Government, and comprised every tribe dependent on the land for support, which owned any considerable area of land in that particular district. Sales by members of these tribes to outsiders could only be made with the sanction of the Deputy Commissioner, for whose guidance explicit rules were laid down, enjoining, *inter alia*, sanction.

¹ L.F.R. 307-44; L.A.M. 7-21, 23, 51; P.A.R. 541.

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in cases where land was required for *bona fide* industrial or commercial purposes. Industrial interests were also protected by the exclusion of municipal areas from the scope of the Act. Mortgages to non-agriculturists were also restricted to certain permitted forms, which would not either be equivalent to, or be capable of being transformed into as permanent transfer of the land to the mortgagee. The original Act also permitted free transfers to agriculturists, an agriculturist meaning a person holding agricultural land as an owner or hereditary tenant either in his own name or that of an ancestor in the male line. But the introduction into the Act of this artificial class of "agriculturists" made its working more complicated. It was done, however, deliberately in order to put money-lenders and others who had been landowners for a long time in a somewhat better position than more recent purchasers. It did little however to disarm the hostility to the Act of the money-lending classes generally, and it was abolished by an Amending Act in 1907. The working of the Act brought to light that in some districts in the hills and in the south-east, certain clans of Brahmins were engaged both in agriculture and in other pursuits. To enable such as were cultivators to preserve their land, while restraining those who were money-lenders from acquiring agricultural land unrestrictedly they were declared a separate group to other agricultural tribes, and were only permitted to buy and sell land within their group.

The passing of the Act, if it did not prove the salvation of the agriculturists, at any rate averted their utter ruin. Sales and mortgages were still extremely frequent, but the balance was in favour of the agriculturists. It was urged by its opponents that the Act would reduce the credit necessary to finance cultivation, and that the price of land would depreciate. But these fears proved groundless, and land was still freely transferred among agricultural tribes. In some cases members of agricultural tribes took to money-lending but, even so, less harm was done by the transfer of and to them than if they had been professional money-

lenders, for they were interested in agriculture and realised the factors necessary for practising it successfully.¹

The recasting of the law of pre-emption was one of the corollaries to the passing of the Punjab Pre-emption Act. Alienation of Land Act. Tribal custom had always recognised the right of the landowner to the exclusive use of his property during his lifetime; but the right to alienate inherited landed property (either by gift or bequest) had generally been subject to certain restrictions. All the descendants of the first owner, or body of owners, were considered to have some sort of residuary interest in such property; and the owner in possession was not regarded as having the power to dispose of it, so as to defeat the expectations of those who were deemed to have a residuary Interest. Such an alienation to the prejudice of the reversioners could only be justified in exceptional cases of urgent necessity. The great mass of the landed property in the Punjab was held by small proprietors, who cultivated their own land in whole or in part. When any of these proprietors wished to sell his rights, the other members of the village community to which he belonged had a preferential right to purchase them at the same price as could be obtained from outsiders. But this ancient right of pre-emption, which was intended to prevent the disintegration of the village proprietary body had been deprived of most of its value by Chief Court rulings, which enabled a non-agriculturist, when he had once gained a footing in a village community, to buy up other shares in the village as they came into the market, and so expropriate the true agriculturist and break up the village community, it was to prevent this that the Punjab Pre-emption Act² was passed. But the pre-emption law was admittedly unsatisfactory and gave rise to abuses, particularly in the form of bogus threats by persons with rights of pre-emption to enforce those rights when a sale of land was in question. Moreover with the passing of the Alienation of Land Act, the main function of

¹ L.A.M. 24-50, P.A.R. 233-9, 541; Thorburn P.P.W. 256-9.

² Act II of 1905.

the doctrine of pre-emption, the prevention of the expropriation of the peasantry by outsiders, had become superfluous. Its importance in the rural economy of the Province therefore tended to diminish. ¹

The economic geography of the Punjab did much to give an artificial stimulus to money-lending. Agriculture was the essential industry of a land-locked province, which suffered from the disadvantage of being bounded on three sides by countries that offered no market for its products. Thus the development of communications which followed on the introduction of British rule could only open up the Punjab to the products of outside industry, and could not develop the industry or the through trade of this Ultima Thule of the Indian commercial zone. Thus industry and commerce stagnated, and the capital which rapidly accumulated with the increasing prosperity of agriculture could find no outlet except in the economically unproductive fields of litigation and money-lending and at the expense of agriculture. ² Moreover industrial progress is dependent on sound finance, and Punjab industry suffered from a lack of that knowledge of business principles which is the foundation of European and American industrialism. About 1911 there was a boom in companies of doubtful reputation. Ignorance of business methods among the promoters and still more well-founded belief in the ignorance and credulity of those who would be their creditors and clients, led to the flotation of numerous hopeless ventures. Many so-called "banks" were started which neglected precautions which had been the ABC of English banking for centuries. The smallest country bank in England realised the importance of fortifying itself against times of stress by a series of reserves of cash, money at call and short notice, high class Government securities, and bills of exchange for periods which seldom exceeded three months. Such a series of defences enabled cash to be rapidly available in case of a run on the bank. The one fatal error was to lock up money in a long

¹ L.F.R. 321-2; P.A.R. 238, 240-1.

² L.F.R. 316.

term loan on security which could not easily be realised. Yet the practices of the Punjab "banks" might have evoked the warnings of the Venetian senator.¹ "Money is not received by bankers to lie idle in their safes. It is invested at a profit. But it is easier to invest than to realize, and failure in one speculation may precipitate disaster. Banking is a harmony of too many subtle chords; a false note produces an universal discord. Further, most men cannot resist the temptations which assail the banker to indulge his taste in splendid houses, furniture, jewels, dress, when they can be had by a stroke of the pen; nor will he refrain from seeking brilliant matches for his daughters at the expense of his capital. Finally, there is the temptation to keep his old friends and gain new ones by granting them accommodation on insufficient security." Practices of this kind led to the inevitable results. In 1913-14 ten banks with a paid-up capital of Rs. 19 lakhs closed their doors. In the following year 19 more banking companies failed and, as a result of the damage to the finance and credit of the community, 22 trading companies also came to an end. These failures were expedited by the stringency caused by the greater regulation of joint stock enterprise following on the passing of the Companies Act of 1913. This wave of optimistic investment and fraudulent flotation led to a shaking of credit and a disruption of trade, which turned joint-stock enterprise into a subject of distrust and prevented it from taking its proper place in financial and industrial expansion.²

But while unduly reckless in their financial ventures The money- (especially with other peoples' money) the lending capitalist class shewed a timid conservatism in classes and the paths of industrial progress. Instead of the Govern- ment. searching for outlets along new lines, they confined themselves to imitating any venture that had proved successful, and a pioneer cotton ginning factory, which could profitably absorb the cotton output of a neighbourhood, would generally be ruined by the competition of half a dozen mush-

¹ Morosini, quoted in *Brown* 84-5.

² *Rae*; *P.A.R.* 589.



room imitators. Admirable parasites but poor pioneers, the money lending classes were being found out. And people do not like being found out; they resent it. In this case the wrath of these humbugs was turned against the Government which had disclosed their weakness, and whose policy was now definitely directed to protecting the peasantry against their methods of exploitation. Driven from control of the Executive they were still strongly entrenched in the Chief Court, and the clamour for the separation of the Judiciary from the Executive and for its freedom from Executive control now became loud and insistent.

11
A still more effective weapon was discovered in the development of the arts of propaganda. The peasantry were slow to realise that the Government, which had neglected them for so long, had now become their friend, and the very Magna Charta of the peasant the Alienation of Land Act, was misrepresented as a Government plot to depreciate the value of the peasant's sole property, his land. Attempts were made to excite the peasantry against Government by seditious articles in the Press, which was entirely controlled by the money-lending interest, and by the poisoning of wells and charging the crime to a Government, whose plague inoculations, sometimes causing the death of those inoculated, had rendered such an accusation not wholly incredible. Matters came to a head with the passing of the Colony Bill of 1907. "The Bill, though intended to safeguard the respective interests of the Crown and the colonists of Crown lands in Lyallpur, was regarded, and with some reason, as unduly restrictive in some of its provisions. Two notorious agitators, Lajpat Rai and Ajit Singh, thought the opportunity a good one to spread their seditious propaganda among the rural classes interested in the Colony, especially the Sikhs, and this led to menacing demonstrations and riots in Lahore, Lyallpur and Rawalpindi. The situation was promptly and firmly dealt with by the new Lieutenant-Governor, Sir Denzil Ibbetson; and Lajpat Rai and Ajit Singh were deported to Burma under an old regulation,¹

¹ Regulation III of 1818.

which had remained unused for so long that its very existence had been almost forgotten. "This firm action and the prosecution of the *Punjabi* newspaper for sedition knocked the bottom out of the agitation. The Viceroy, Lord Minto, withheld his sanction to the Colony Bill and the agitation died away. It showed, however, how the rural classes, especially the Sikhs, could be worked up into a dangerous ferment by urban agitators who had no real sympathy with them, but desired to antagonise them with the Government¹.

The Hindu agitation was the easier to deal with inasmuch as the Muhammadans had so far shewn no signs of joining it. For the most part agriculturists, the Muhammadans² were guided in political matters by their town-dwelling brethren, who were both more orthodox and more anti-Hindu than their country cousins. Moreover the benefits conferred on the (mainly Muhammadan) agricultural population of the Punjab by the Land Alienation Act, and the subsequent freedom of Muhammadan Eastern Bengal from the rule of the Hindu Bengali Babu at Calcutta, had added a feeling of identity of interests to the old Muhammadan tradition of uncompromising loyalty to the British Government. But in 1912 the Turkish wars against Italy and the Balkan allies created a tendency among the younger generation of political Muhammadans to discard old traditions. This tendency was greatly strengthened by the sacrifice of Bengal Muhammadans to Hindu clamour involved in the revocation of the partition of Bengal, an act which seemed to shew that agitation rather than loyalty was the better path³. For this sacrifice the transfer of the Viceregal Court from the mudbank on the Hoogly⁴ to the old Mogul capital of Delhi was an inadequate compensation. The transfer was a loss to the Punjab in more ways than one. Delhi was created a separate province, after the fashion of Washington or

¹ PAR 35, 460;

O'Dwyer 129, 183-5.

² Holderness 128-30;

PAR 460, 623, 627;

Smith India 774-5.

³ Calcutta.

⁴ For details see Appendix III.

Canberra, the size of which was the subject of many a merry jest in the Jat villages of the neighbourhood. The severance cut off Delhi from the neighbourhood of which it was the natural centre, and as a result the Commissioner of the old Delhi division, ¹ was removed from Delhi to Ambala. Situated as it was at the extremity of the division, Ambala was the worst possible centre for administration; ² but from the Commissioner's point of view it had the great advantage of being a military station with all the accompanying social delights and conveniences. ³

3. THE GREAT WAR

Oh, East is East, and West is West, and never the
 twain shall meet,

Till earth and sky stand presently at God's great judg-
 ment Seat;

But there is neither East nor West, Border, nor Breed,
 nor Birth,

When two strong men stand face to face tho' they come
 from the ends of the earth !

KIPLING : *The Ballad of East and West.*

The anti-Government agitation in the Punjab had hard-
 ly been coordinated with more-violent forms
 The Sikh Conspiracy. of anarchy in Bengal, when Germany, the arch-
 Anarch threw her mighty bomb into the midst of a peace-
 ful and unprepared Europe. Thus, when the Great War broke
 out in 1914, Sir Michael O'Dwyer, the Lieutenant-Governor,
 was faced with a Hindu literary class, hostile though quies-
 cent, and with the Muhammadans half-alienated. "There was
 much inflammable material lying about, which required very
 careful handling if an explosion were to be averted." Ger-
 many's preparations for the War had not been confined to

¹ Comprising the districts of Simla, Ambala, Karnal, Rohtak, Delhi, Gurgaon and Hissar.

² It took the Deputy Commissioner of Hissar no less than 24 hours by rail to reach his Commissioner, while he could reach Lahore or Delhi in 12 hours

³ P.A.R 36, 696.

increasing her military and naval resources. Propaganda, particularly anti-British propaganda in India, was equally one of her instruments of war.

For this purpose she found a fitting tool, the sinister Har Dyal, a native of Delhi, whose undoubted talents had been developed by a brilliant academical career at St. Stephens¹ College, Delhi and St. John's College, Oxford. For his revolutionary activities, the Sikhs offered the most promising field. Virile and war-like, they were easily susceptible to outside suggestion, good or bad, and it was at them that the anti-British propaganda of 1907 had been mainly directed. "The attempt met with but little success in the Punjab, where there were then many loyal and influential Sikhs to remind their brethren that they owed to the British Government their continued existence as a separate religion and something approaching a separate nationality. But the thousands of adventurous Sikhs, who from 1907 onwards emigrated in increasing numbers to the Far East, the Pacific coast of Canada, and the United States, had lost touch with these restraining influences, and fell gradually under the influence of clever intriguing Hindu revolutionaries. By working on their ignorance, their credulity, and their grievances, real or imaginary, in connection with the Canadian immigration laws and the status of Indians abroad, Har Dyal and his associates succeeded in enlisting many of them in a conspiracy to subvert British rule in India"; and in the summer of 1913, three Sikh delegates came from Canada, and actively, but secretly spread sedition among their co-religionists in the Punjab. Soon after the War began it was ascertained that thousands of Sikh emigrants were on their way back from America to the Punjab. A band of these, which had been refused admission into Canada, came into violent conflict with the troops and police on landing at Budge Budge in Bengal. A number escaped to inaugurate an extensive campaign in the Central Punjab with the object of obtaining arms and funds, an enterprise in which they were assisted by other returned emigrants who managed to make their way into the country in spite of an Ingress Ordinance which had been

¹ Cambridge Mission.

promulgated to prevent them. Attempts were made to tamper with the loyalty of the troops, and a serious though unsuccessful rising was planned for the night of 21st February 1915 at Lahore and Ferozpur.¹ But the prompt measures taken by Government through the Police and district officials resulted in the detection and suppression of the conspiracy before widespread harm could result.

Effective control over the whole mutinous movement was however finally established by the appointment of district committees of loyal Sikhs. Their function was "to enquire into the conduct and reputation of the returned emigrants and their supporters, and to advise the Deputy Commissioner as to the action to be taken under the Ingress Ordinance or the ordinary law. These Sikh committees proved to be a most valuable help to the Administration; they associated with it the leading Sikhs and through them all the loyal members of the community; they gave the Deputy Commissioner most valuable information which enabled him to supplement and check the reports he was receiving from the overworked Police; and finally, at a later stage, they enabled him to show that the committees were not utilized solely for punitive purposes, for releases from internment and other restrictions were made by Government or the Deputy Commissioner in consultation with the Sikh committees. The system worked smoothly and successfully and by its means the revolutionary activities among the Sikhs were effectively kept in check."²

Hardly however had the Sikh mutiny been frustrated when an uprising in the south-west Muhammad-an agrarian of the Province claimed the urgent attention of Sir Michael O'Dwyer. Muhammadan dissatisfaction with British policy prior to the War had been accompanied by a Khilafat³ agitation claiming the allegiance of all true Muhammadans to the Sultan of Turkey as the Caliph of Islam, an agitation which received

¹ P. A. R. 37, 456; O'Dwyer 168, 176-82.

² P. A. R. 37; O'Dwyer 204-5.

³ from Khalifa = Caliph.

fresh fuel as news arrived of the exciting events in Europe. The great German sweep on Paris had been checked at the battle of the Marne; but the Allies had failed to convert the defeat into a rout, and the Germans had entrenched themselves in the heart of the industrial districts of France. The stalemate gave time for German propaganda to complete its work in Constantinople, and by November 1914¹ Turkey had definitely come forward as the ally of Germany.

The advent of Turkey into the War on the side of Germany gave opposition to England the character of a Holy War. Fostered by certain seditious newspapers, the rumour soon spread "that the Germans and Turks were advancing on India and that the British power was on the wane. The Muhammadan peasantry of the south-west Punjab were a simple, credulous and home-staying people, lacking the virile instincts of their martial brethren of the north-west. They were as a body heavily in debt to Hindu money-lenders and were suffering from the high prices and contraction of credit due to the War. There was also a severe epidemic of plague which drove many of the Hindus to the towns. The peasantry seized this opportunity to pay off old scores. They rose in a body, looted the shops of the Hindus, seized their grain and money, burnt the account-books which recorded their debts, and began a campaign of disorder and looting which spread with alarming rapidity". The word went round that the British had gone, a belief strengthened by the fact that emissaries to a district headquarters happened to arrive on a Sunday when the offices were shut, and the flag hauled down. The peasantry organised themselves in bands, under two leaders who posed as the Kaiser and the Crown Prince. Within a month² they had committed some fifty gang robberies on the Hindus. There was great destruction of property, little loss of life. Four or five Hindus died of their injuries and six or seven of the jacquerie were shot by the police and villagers. Armed police were rapidly rushed into these remote districts to restore order and round up the plundering bands, which crumbled away

¹ Odessa was bombarded on 29 October.

² 22nd February to 20th March 1915.

without resistance under the strong hand of authority. During the outbreak no Government property was looted, no Government servant attacked. "A few companies of British Territorials from Multan were marched through the affected tracts, and were welcomed and entertained everywhere on the march. Some four thousand of the raiders were promptly arrested" and confined in a concentration camp at Multan¹.

"The rapid collapse of the rising was hastened by the passing², at this critical stage, of the Collapse of the rising. Defence of India Act, and the setting up of the Special Tribunals, which in the popular mind were taken to mean "Martial Law". The Multan Tribunal in a few months dealt with about eight hundred of the principal accused. Some five hundred were convicted and sentenced to exemplary punishments. The rest were discharged because either sufficient evidence was not forthcoming or the law had been sufficiently vindicated. Several of the leading Muhammadans had exerted themselves to protect their Hindu neighbours and restore order; others had shown either apathy or sympathy with the raiders. These latter were dealt with by executive action. A strong force of extra police was posted in the disturbed areas at the charge of the offending inhabitants, and the lesson given was so sharp and prompt that serious crime of all kinds was reduced to a minimum. Naturally there was a residuum of bitterness, especially among the Hindus who had suffered so heavily. To restore good feeling Conciliation Committees were established under tactful and impartial Muhammadan officers, and they after due enquiry, persuaded the offending inhabitants to make good the loss of the Hindus and give fresh acknowledgments of the debts, the evidence of which had been destroyed."³

But energy and foresight would not alone have sufficed to keep the Province quiet, had the Loyalty of the rural classes. the rural population been permanently disaffected. The *laissez-faire* doctrines of the Executive in

¹ O'Dwyer 210-11.

² March 1915.

³ O'Dwyer 211-2.

the Nineteenth Century had combined with the active interference of the Chief Court to render the peasant the serf of the money-lender. Against this policy of negation Thorburn had protested, and his protests had ultimately borne fruit in the Land Alienation Act and the spread of the Rural Co-operative Movement.¹ But at first this new policy antagonized the money-lending classes, without earning the gratitude of the peasantry, who were slow to appreciate this change of heart in a Government which had neglected them for so long, and had thus left them open to the seditious propaganda of the urban Hindus. But the increased prosperity of the peasantry resulting not only from the new policy but also from the great irrigation schemes which were now beginning to cover the central uplands of the Province, had created in them a spirit of healthy independence, and they now began to think for themselves. It was at this critical period that the War broke out, and it was the genius of Sir Michael O'Dwyer that appreciated the importance of the crisis. He proclaimed himself the peasant's friend, and he was known to be a man who was never worse than his word. Desperate diseases demand desperate remedies, and if his frankness made the urban Hindus his personal enemies and rendered him liable to the unjust impertinences of Mr. Montagu it nevertheless turned a potentially rebel province into a bulwark of the Empire; and by frustrating the pan-Islamic schemes of the Kaiser and putting half a million men into the firing line against him, materially helped to win the war.²

"The Punjab, with its hardy and martial rural population of peasant proprietors, had since its inclusion in the Empire, been rightly regarded as the 'Shield,' the 'Spear-head' and the 'Sword-hand' of India; it had won those proud titles by its association with the flower of the British Army in every Eastern campaign since the Mutiny." In less than ten years from the end of the Second Sikh War

¹ L.F.R. 279-346.

² O'Dwyer 171-198.



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the British and Punjabis together saved India from the Mutineers. British and Punjabi soldiers had learnt their work together in many a cantonment and had fought shoulder to shoulder in all sorts of battles and expeditions, from Ashanti to Peking. "This gallant record had perhaps led the Military authorities from 'Lord Roberts' time to concentrate too much on the Punjab fighting men—the Rajput, Dogra of the lower Himalayas, the Punjabi Muhammadan of the north-west," the Jat of the south-east, and the Sikh of the central Punjab, to the neglect of the fighting material of other provinces. "Accordingly on the outbreak of the War, one half of the Indian Army was drawn from the Punjab, over one-sixth from the Frontier and trans-border Pathans and the gallant Gurkhas of our Nepal ally, and less than one-third from all the remaining Indian races.¹

Sir Michael O'Dwyer was the mainspring of the Province's War efforts. His belief in the Punjab never wavered; his estimate of what the Province might be called upon to do staggered the cautious-minded; but the Province proved him right. At a meeting of the Punjab Legislative Council on the 19th September 1914, he described the Province's gallant entry into the conflict, and set the main lines of the course which the Punjab was to follow,—'a solemn determination to maintain the proud traditions of the Province by serving His Majesty in every form in which their help may be required.' For the next twelve months, he had to concentrate his energies on the suppression of internal disorder; as soon as this was successfully accomplished, he turned his attention to the battlefields abroad; but even in 1916 all that was necessary was to encourage and reward those districts which had always been the 'catchment-area' of the Indian Army.

For the first twenty-nine months of the War, there was no attempt on the part of the Military authorities to change the system of recruiting which had previously been in vogue. This

¹ O'Dwyer 41, 213-4, 413-15; P.A.R. 38.

consisted partly of 'direct enlistments' (whereby a young man whose family was connected with a certain regiment could present himself as a recruit at the Regimental Depôt) and partly of 'class recruiting' which meant that recruiting officers were posted at various cantonments with a view to enrolling recruits of a particular 'class'—Sikh, Punjabi Muhammadan, Dogra or Hindu Jat—the recruits being discovered by recruiting parties sent out by regiments. This system had worked well enough in peace time, but it naturally tended to restrict activity to certain well-recognised areas. In India, military service, like many other things, is largely a matter of custom, and there were whole districts which were quite unknown to the Army, and likely to remain so for all time. There was also considerable exclusiveness on the part of the Army itself, and certain tribes capable of providing excellent material were barred by reasons of some real or fancied social objection. This ruled out the sturdy artizans. Sayyids and Qureshis, the reputed relatives of the Prophet, were also viewed askance, because it was thought that their spiritual prestige amongst Muhammadans would cut across the ordinary lines of military discipline. Many fine agricultural tribes, well qualified to march with the pick of that magnificent manhood, were held suspect by the military authorities because their tribe name was unfamiliar. The zeal of many a keen recruit was quenched, when after a long journey to a distant cantonment his weary wait was terminated by the arrival of the Recruiting Officer with the information that he did not cater for recruits of that particular class.¹

Under this system of recruitment the districts with old military connections did best. Aid from the Civil authorities. In some of them, the efforts of the Military authorities had from the first been usefully reinforced by civil officials or by local organizations of public spirited inhabitants. In October 1916, the Civil Authorities were invoked with a view to raising 10,000 drivers for transport. The whole number was made good in 18 days, and

¹ P. A. R. 40-1.

Sir Michael O'Dwyer reported that many more could have been obtained had they been required. This clearly shewed that a valuable instrument of power supply had been ignored.

Moreover it had by this time become clear that very large demands would yet have to be made upon the man-power of the Province. The inspiring effect of the original German repulse on the Marne had been succeeded by the premature and ill-considered attempts to break through at Loos and Neuve Chapelle, attempts which starved and ultimately ruined the vital strategical attack on the Dardanelles. But the eyes of India were directed East. The entry of Italy into the War ¹ on the side of the Allies was hardly noticed, but the vital issues which hung on the Dardanelles were more fully appreciated in India than in England. Gallipoli meant Turkey and Turkey meant Islam; and the failure at Suvla Bay, ² the consequent entry of Bulgaria into the War, ³ and the final evacuation of the Peninsula ⁴ were witnessed with ill-concealed enthusiasm by ardent Muhammadans. Fortunately the Russian capture of Erzerum ⁵ did something to obliterate the unfortunate impression created by the muddled Mesopotamian campaign, culminating in the disaster of Kut. ⁶ Yet it was well for the Punjab, well for India, well too for the British Empire, that Sir Michael O'Dwyer had his province firmly in hand before such bad news could filter through. Meanwhile the Russian steam-roller had started rolling in the wrong direction, and the German error at Verdun ⁷ was repeated by the British on a greater scale by the ghastly holocaust of the volunteer army on the Somme. ⁸ Better realised in India were events nearer East—the victories of Brusiloff ⁹ and the tardy adherence of Roumania ¹⁰ to the cause of the Allies. These set-backs gave England conscription and Lloyd Gerge's

¹ 23rd May 1915.

² 10th August, 1915.

³ October 1915.

⁴ 8th January 1916.

⁵ 19th January 1916.

⁶ 29th April 1916.

⁷ 21st February to 18th December 1916.

⁸ 1st July to 20th November 1916.

⁹ Summer of 1916.

¹⁰ 27th August 1916.



will to win, but the Germans had at last found a brain in Ludendorff, which easily defeated the feeble leadership of superior numbers and crushed Roumania in a vice between Falkenhayn and Maekensen. ¹

Conscription in England demanded some further effort in India, and the well-known recruiting grounds of the Punjab were beginning to shew signs of exhaustion. The "class" system of recruitment had been tried and found wanting, and at the beginning of 1917 it was superseded by the "territorial" method. Each civil division was given a Divisional Recruiting Officer, and to each suitable district a District Assistant Recruiting Officer, taken in most cases from the ranks of Civil officials, was appointed, each of whom was authorised to enrol recruits of all "classes" within his jurisdiction. ²

Meanwhile in Europe the issue of the War was still uncertain. Ludendorff had come too late to win the war for Germany, and he had to agree to the submarine campaign with the resulting inevitable entry of America into the War. The failure of the submarines was balanced by the collapse of Russia, which again gave Germany the advantage of the initiative. While Europe was thus locked in conflict, the Punjab was not idle. By the middle of 1917 the control of recruiting had been definitely transferred to the Civil authorities, under whose auspices a Provincial Recruiting Board was constituted, which held its first meeting on July 14th, 1917, and at once set itself the task of popularizing military service among those who hitherto had no military connections. As a result of its recommendations "a bonus of Rs. 50 was given to every combatant recruit on enlistment, and special war allowances were sanctioned for all ranks." The evils of competing agencies were reduced to a minimum by the Board, which secured a high degree of correlation between regimental and private recruiting agencies, and Divisional Recruiting Officers. It was an accepted maxim of all the best authorities that the best possible recruiter in the wavering districts

¹ 6th December 1916.

² P. A. R. 42.

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was the newly joined recruit. It was a common experience to find a youth, who had but a short while before been hardly prevailed upon to leave his village, coming back full of enthusiasm and self esteem and persuading his friends to follow his example. One of the most successful innovations was the opening of local depots by particular regiments for a certain length of time in places where there were large numbers of eligible men with no previous military connections. This enabled shy young men and overfond parents to see for themselves what life in a regiment meant, before committing themselves or their sons to it. It also meant that, for the first few months of their service, recruits were able to pay frequent visits to their homes, and to exhibit to their relations what regular exercise and a soldier's diet could do in the way of converting a country bumpkin into a well-set-up young man. In many tracts where the peasants had got into debt; good food and warm clothes to protect them against the bitter Punjab winter were in themselves a sufficient recommendation to the army. A certain amount of feeding up was also necessary to bring recruits up to the standard demanded by regimental officers, who failed to realise the strong physique which underlay the half-starved bodies of these indebted peasants. ¹

Meanwhile in Europe Ludendorff's brain had given Germany victory after victory. Having put Italy out of action at Caporetto he frightened Russia into the peace of Brest Litovsk, thus freeing himself for a final offensive on the western front in 1918. Though missing some of its objectives the offensive was at many points only too successful, and Germany had never seemed nearer victory than in April 1918 when the Prime Minister of the United Kingdom sent his memorable message to India. Then at long last the Viceroy summoned a conference at Delhi to call on the provinces to exert themselves to the uttermost at this critical time. The Punjab was not slow to respond. At a meeting called by Sir Michael O'Dwyer

¹ O'Dwyer, 222; P. A. R. 43, L. F. R. 339 n.



in the University Hall, Lahore, it was agreed that the Punjab would raise its annual offering of recruits from one lakh¹ to two; that nine-tenths of these would be combatants and that conscription would be introduced if the men could not be got in any other way. The pessimists shook their heads; even of the optimists many thought that conscription alone would produce the number of recruits promised, but the men came in according to schedule, and at the end of September the Punjab was well ahead of the estimated requirements.²

The results of this campaign were most creditable to the Punjab. At the outbreak of the War, there were serving in the Army about 100,000 Punjabis, of whom 87,000 were combatants.

During the War, no less than 380,000, of whom 231,000 were combatants, were enlisted, making a total of 480,000 who served. This total includes those recruited from the Punjab States and represents over a third of the entire contribution of India towards the forces of the Empire. Of the male population of the Punjab one man in 28 was mobilized, in the rest of India one man in 150. The Sikhs who had been so rebellious at the beginning of Sir Michael's *regime* ultimately supplied no less than 90,000 combatant recruits out of a population of only 2½ millions; their martial ardour being stimulated by the news of the heroic stand of the 19th Sikhs in Gallipoli against an overwhelming Turkish force.³ Apart from man-power the contributions in cash and kind from the Province and the Indian States within its boundaries were also most generous, and the total amount raised for such funds as the Punjab Aeroplane Fund (through which 51 aeroplanes were purchased), the Imperial Relief Fund, Red Cross Funds, Comforts Funds and so forth was over Rs. 2½ crores.⁴ In addition to this, the Punjab lent to the Government of India at least Rs. 11½ crores,⁴ its subscriptions to both the first and second Indian War Loans being only exceeded by those of the wealthy commercial provinces of Bengal and Bombay.⁵

¹ Lakh = 100,000.

² 4th June 1915.

³ P.A.R. 44.

⁴ See Appendix IV.

⁵ P.A.R. 45; O'Dwyer 207, 217, 227.

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But "while the Punjab was redeeming its pledge, other Provinces, and especially those who were loudest in their claims for political concessions as a reward for India's (?) War services were taking matters very lightly. For this failure the Government of India were partly responsible." The facile optimism which had driven on General Townshend against his better judgment to a futile attempt on Baghdad with inadequate forces, was succeeded by a no less facile war-weariness once the red-tabbed and gaitered warriors of Simla had realised the death of all their ambitions in the disaster of Kut.¹ The incompetence with which they conducted the Mesopotamia campaign from the distant Simla hill-top was gradually realised in India and did much to add to the difficulties of recruiters everywhere. Moreover "in introducing the Budget in March 1916, the Finance Member found cause for satisfaction in the fact that, though the British Empire was fighting for its life, the Indian Military expenditure was being reduced owing to the Home Government accepting all charges for the divisions at the Front." It was not till 1918 and then only at the urgent demand of the English Prime Minister, that the Viceroy bestirred himself, and then his efforts were too late to be of any practical assistance. It was neither to India nor the Government of India, that the credit for India's effort was due, but to the Punjab and its inspired leader, Sir Michael O'Dwyer.²

4. THE PUNJAB DISTURBANCES OF 1919.

Periculosæ plenum opus aleæ,

Tractas et incedis per ignes,

*Suppositos cineri doloso.*³

HORACE. Odes II, 1.

(To Pollio, writing a History of the Civil Wars.)

¹ Surrendered by General Townshend to the Turks, 29th April 1916.

² *O'Dwyer*, 217.

³ Thou art treating of a task full of dangerous hazard, and art walking, as it were, over fires hidden beneath treacherous ashes.



Though the British won the War, they lost the Peace, and the same may be said of the rural War services of the rural classes recognised by Government. The educated classes, or at least the element in them inclined, to political activity, had to a large extent withheld their co-operation from the measures which aimed at assisting the prosecution of the war; rightly calculating that great would be their reward, should the Germans win, while in the event of a British victory, there was always the hope of confusing the issues by political chicanery and thus winning (as in fact they did win) the Peace. Meanwhile they saved both their lives and their money and sneered at the foolish rustics who were willing to fling away both at the bidding of Sir Michael O'Dwyer. But as yet the laugh was not all on their side. As the War advanced, the remittances which the Indian soldiers made from their now liberal emoluments formed an important addition to the resources of the peasantry from which they were drawn. During the winter after the War, Sir Michael O'Dwyer made a triumphal progress throughout the Province, distributing rewards among those rural classes whose splendid services had so richly deserved them, rewards which (judged by previous standards) were not only large in themselves but which were considered (and meant) to be an earnest of increased recognition from Government in the future. ¹

But all this was gall and wormwood to the money Muhammadan lending classes, whose importance was now disloyalty. greatly increased by an alliance with the political Muhammadans of the towns. These latter had during the War been involved in the design "to unite all the forces of Islam,—the Turks, the Arabs, under the Sherif of Mecca, the Afghans, the Frontier tribes, and the Muhammadans of India—in a combined effort against British rule. This was to take the form of an attack by the Frontier-tribes,—a matter easy enough to manage and which in this case did come off—supported by a general Muhammadan rising in India. It was hoped that the revolutionary Hindus

¹ O'Dwyer 223, 265.

and the America-returned Sikhs would at once join in. "The design failed, mainly owing to the revolt of the Sherif of Mecca against the Turks ¹, which "divided Islam, and knocked the bottom out of the project for combined action against British India." But the snake though scotched was not killed, and a "Provisional Government" of India "remained firmly rooted in Kabul, whence it continued to encourage seditious agitation in India and hostile action by the Frontier tribes throughout the War". When peace "broke out" even the loyal Muhammadan peasantry began to be concerned about the probable fate of Turkey and the holy places of Islam.²

The best instrument for the self-expression of this (now united) Hindu-Muhammadan agitation was the Press, whose importance as a means of propaganda grew rapidly with the spread of education amongst the people. In 1883, 23 papers had sufficed for the needs of the Punjab. But as Government grew more sympathetic to the peasant it earned the increasing hostility of the educated townsman who controlled the Press, and the beginning of the twentieth century witnessed a remarkable increase in journalistic activity, the number of newspapers rising to 221 in 1905, and 253 in 1909. But the increasingly scurrilous nature of the Press attacks on Government resulted in the Press Act of 1910, which however only exercised a temporary restraint, the number of newspapers and periodicals of all kinds published during 1914 rising to 272. This was the highest figure ever recorded. Thenceforth the power of the Press grew by the increase in circulation rather than in the number of papers and periodicals. But this organ of propaganda did not so much voice as direct the public opinion of the towns, and it was entirely out of touch with the rural masses. It claimed to represent the many varying shades of Indian political opinion. "But with a few exceptions in the great cities, the newspapers had little solid foundation, little

¹ June 1916.

² P. A. R. 46, O'Dwyer 178, 181.

financial or political stability", and little independence of thought, receiving both money and ideas from the anti-British urban political caucuses.¹

But though the newspapers so furiously raged together, the people did not then imagine a vain thing. So long as the War lasted there was little open agitation, nor were the rank and file of the town populations obviously under the influence of the seditious clique. The mass agitation, in which the urban proletariat presently took a prominent part, was a novel phenomenon and not an established habit. This section of the body politic had nevertheless other grounds for discontent in the severe economic depression prevailing at the time, in the incidence of the new Income-Tax Act, in the steps which were then being taken to collect Income-Tax more effectively, and in their ancient rivalry with the landed classes, the rewards to whom had stimulated the jealousy of the politically-minded outside the favoured circle, who were also speculating rather pessimistically on their prospects under the Reforms Scheme then adumbrated. High prices reacting favourably on the agricultural population, were attributed by designing persons to the deliberate policy of Government. They were in fact due to the bad Monsoon of 1918 and the dislocation of trade consequent upon the War, economic causes which were not realised by the suffering poor of the towns. A winter, in which the post-war influenza had swept away five per cent. of the population, including a disproportionately large amount of the able-bodied, at the same time lowering the vitality of the survivors, was followed by a bad spring harvest at a time when a bumper crop was sorely needed. It was this moment, when fodder was scarce and famine conditions were in sight, that the Government of India selected for a general disbandment, returning thousands of soldiers, who had reckoned on the meeds of mighty conquerors in a victorious war to homes which were already beginning to feel the pinch of starvation without these extra months.

¹ P. A. R. 459; O'Dwyer 439.



The atmosphere was fatally disposed towards uneasiness and suspicion, but it is improbable that there would have been any open outbreak of disorder in the Punjab had not the agitation against the Rowlatt Act, which was passed by an official majority in the Imperial Legislation Council in March 1919, developed elsewhere so dangerously under the inspiration of Mr. Gandhi and his passive resistance movement. Inspired by Mr. Gandhi the Press represented that the police would have power to invade the sanctity of the home, that the Act would penalize with pecuniary exactions the ceremonies accompanying marriage and death, that four men sitting together could be arrested, and that no landholder would be allowed to keep more than a few acres of land. It was not till the 6th April that the Government of India took steps to publish and explain the Act to the people at large. The uneducated remained unaware that it could only be put in operation in districts where anarchical crimes were being perpetrated and then only after the sanction of the Government of India. To them the Rowlatt Act was the Black Act; and as rumour distorted its provisions, so public indignation waxed. Adopting the catch words of Mr. Gandhi, the political classes disseminated discontent among the urban proletariat. Among the more unsophisticated residents of the cities and towns the grossest misrepresentation of the subjects and provisions of this legislation gained credence; while the more intellectual party were invited to take the vow of 'civil disobedience to the laws'. This novel stratagem gained no support in the Punjab; but the time-honoured Eastern device of displaying popular resentment by a *hartal*, or a day's complete cessation from business, made a strong appeal to the city population.

Hartal is a characteristically Indian institution, its literal meaning is the closing of shops in token of mourning, but it has an insidious suggestion of violence, for by immemorial tradition the first symptom of a popular outbreak in India is uneasiness lest the bazaars should be looted by the disorderly elements of the urban population. It may be briefly characterised as mourning flavoured with excitement, the excitement



being only too likely to spread amongst the large masses of people immobilised by the shut shops, and consequently roaming about with nothing to do but mischief. Nor were *hartals* of common occurrence prior to these disturbances. Later on, they became so, and in time the announcement of a *hartal* meant nothing but a certain amount of trouble for the authorities and a certain dislocation of trade, not always acceptable to those who had to close down their businesses. But in 1919 the idea of a *hartal* was still portentous and a far greater instrument of mischief than any abstract principle of resistance. It was with the proclamation of a *hartal* therefore that, on the 23rd March, 1919 Mr. Gandhi began his war against the Rowlatt Act. The date fixed was the following Sunday, the 30th March, but in the Punjab there was some doubt about this, and *hartals* took place on that date only at Amritsar, Multan and a few other places.¹

There was no such misunderstanding however in Outbreaks at Delhi. The metropolis of India, it formed Delhi. a separate administration under a Chief Commissioner, who was a mere tool in the hands of the Government of India. "And the Central Government was at that time divided and infirm of mind, vacillating," pulled hither and thither by a number of conflicting forces. Mr. Montagu, intent only on the Reforms Scheme, and prepared to sacrifice everything and everybody in its interests, pressed for a policy of indulgence, that being (he fondly fancied) most likely to create a favourable atmosphere for the reception of his pet scheme. But the wiser minds of the Government of India knew only too well the necessity for firmness in dealing with the agitation. Between these two contrary policies Lord Chelmsford oscillated. "The Indian politicians, with whom Mr. Montagu desired to work, were among the enemies most dangerous to British rule. To allow them to conspire, and at the same time to protect India against their conspiracies, was a dilemma over which Lord Chelmsford and his favourite counsellors scratched their heads in vain."²

¹ P. A. R. 46; O'Dwyer 267.

² Dyer 130-1.



Delhi therefore formed a safe G. H. Q. whence the leaders of the rebellion could direct operations without risking any of the dangers of the firing line. The *hartal* therefore took place at Delhi, and, as any sensible man who knew the temper of an Indian mob could have foreseen, the passive resistance of the *hartal* was soon enforced by violence and intimidation. The railway station at Delhi, the focus of all the railway traffic of Northern India, was stormed by the mob in order to compel the vendors of food and sweetmeats to close their shops. They resisted and were assaulted, some damage being done to the station. The police were called in, but failed to eject the mob, which assaulted the British police officers present, and remained hostile and riotous, even after the release of the two ring-leaders who had been arrested. British and Indian troops were then called out to force back the rioters, who resisted, stoning the police and troops. It was only after several of the police had been injured that a magistrate ordered the troops to fire. A few of the rioters were killed, and the mob was pushed back towards the main Bazaar. Then it rallied and again attacked the troops, who at first fired in the air till the mob charged them, when a more serious fusilade produced a few casualties. The mob then charged the troops, and were again fired on with a few more casualties. The ensuing days witnessed a series of disturbances, culminating on April 17th in an attack on a police picquet, which in self-defence killed two and wounded several of the attackers. None of those who incited or participated in the disorders were ever brought to justice; in fact they were regarded, and regarded themselves, as masters of the situation, and as dictating terms to the Chief Commissioner.¹ For weeks order was not restored in the capital of India. The example of the paralysis of authority there was not lost on those who were preparing to defy it elsewhere. Had firm action been taken at Delhi, it is probable that the disorders, which in the next fortnight spread from Delhi through Bombay and Calcutta, the Punjab and Peshawar, would have been averted.²

¹ The title of the executive head of the (so-called) Delhi Province.

² *O'Dwyer* 267-8.



The Delhi disturbances were premature. Sir Michael O'Dwyer was due to retire at the end of April, 1919, and by that time many of the most experienced officers in the Punjab would have departed on the first leave granted them since the outbreak of the War. Thus the most important districts would be in the hands of officers without local knowledge or influence. This was also the time when the anti-British party, which had controlled Afghanistan since the murder of the pro-British Amir Habibullah in February, would be ready to invade the Punjab and succour rebellion from outside.

But Mr. Gandhi and his henchmen miscalculated the effect of their instigations on the fiery spirit of the North. Even the sepoys of the more cold-blooded Ganges valley had ruined the success of the Mutiny¹ by a premature rising at Meerut; and the temper of Punjabi mobs was still more uncontrolled. At Lahore tidings of a violent outbreak at Amritsar coincided with the news that Mr. Gandhi had been refused permission to enter the Punjab. A city mob proceeded up the Mall towards Government House, and on refusing to stop was fired on by the police and suffered a few casualties. Later on, it became necessary again to fire on a crowd assembled near one of the city gates. Various manifestations of sedition in and around the city, accompanied by some violence, marked the passage of the next two or three days; and on the 14th April three leading politicians associated with the *hartal* were deported. A train containing two European warrant officers was sacked by a mob on arrival at Kasur, near Lahore, the officers themselves being murdered. Other Europeans there were rescued with difficulty from death at the hands of the crowd. Post-offices were looted or burned, and finally the gathering was dispersed by the fire of the police. At Gujranwala violence was not indulged in until the 14th April, when attacks were made on the telegraph and telephone wires and the mob was fired on by police in the course of an attempt to destroy the main railway line. Subsequently, the post office, the *tahsil* buildings, the English church, the rest house² and the district

¹ Of 1857.

² Where officials could stay when on tour.



court were burnt. Order was only restored when three aeroplanes arrived and employed bombs and machine-guns to scatter the crowds. The disorder which showed itself in the town of Gujranwala spread extensively in the Gujranwala district, outbreaks occurring in fourteen different places, accompanied by attacks on Europeans and on the railway and its communications. At Gujrat a mob which had made an attack on the Mission School and the Railway Station had to be dispersed by fire, while one or two comparatively minor outrages, such as the derailment of a train and cutting of telegraph wires, were reported. In Lyallpur district also damage was done to Government property and railway communications. In other districts there were sporadic outrages, many of them in cantonments or at important points on the main lines of railway.¹ The systematic attempts to paralyse communications by cutting telegraph wires, breaking down bridges, ruining railway stations and derailing trains, all pointed to a Hidden Hand, directing the madness of the mobs, and preparing the way for the great invasion from Afghanistan.

In the towns there were no longer Hindus and Muhammadans, all were Indians, anti-European and anti-Christian. Political rapprochement between Hindus and Muhammadans was a new thing in the Punjab, though it had for some time been a feature of Home Rule politics in other parts of India. Now, however, meetings resounded with the cry of "*Hindu-Musālmān ki jai*,"² and unity was preached from every platform. With a few exceptions however the rural population remained unshaken in its allegiance, and definitely anti-British action was confined to the towns.

It is difficult to determine what might have been the outcome of these occurrences, had Events at Amritsar. events in Amritsar not taken an unforeseen turn. That populous and turbulent city had offered a particularly fertile soil for the seed of sedition. The poor were hit by high prices, the rich by a severe

¹ P.A.R. 49, 50. O'Dwyer 226, 272.

² Victory to the Hindu-Muhammadan Alliance.

income tax assessment and the excess Profits Act. Muhammadans were irritated about the fate of Turkey. The wealthy traders of this great distributing centre had been hard hit by the commandeering of railway trucks to carry troops. Their speculations in corn were upset by Government purchases on public account and by the prohibition of export to prevent famine.

The prevailing discontent was exploited by two of the leading agitators, Dr. Saif-ud-din Kitchlew, a Kashmiri¹ Muhammadan Barrister with a Muhammadan degree and a Hindu Assistant Surgeon Satya Pal. "It was unnecessary said the wily Kitchlew "to shed streams of blood in the sacred land, but they should prepare themselves to disobey all orders which might be against their conscience and the commandments of God."

Vainly the Deputy Commissioner tried to restrain them : neither threats nor cajoleries were of any avail. Matters had gone too far. Such leaders must go on or forfeit their leadership. Urging them on were bands of hooligans, organised under gang leaders², who had been enrolled for purposes of intimidation in the recent Municipal elections and had never been disbanded. These gangs gave a coherence and consistency to the fluctuating passions of the mob. Matters came to a head when the Punjab Government ordered the deportation of Kitchlew and Satya Pal. Invited to the Deputy Commissioner's house on the 10th April 1919 for a conference they were whisked off in motor cars for internment at Dharmsala before anyone knew what had happened. On this ruse becoming known, an angry mob collected, which was only prevented from rushing the civil station by the fire of protecting military picquets. The casualties inflicted infuriated the rioters, who proceeded to commit a series of atrocious outrages in the city. The National Bank was looted and gutted. The British Manager and Assistant

¹ The Kashmiris are held in contempt by the manly peasantry of the Punjab. *Pahile lat, piche bat, tab Kashmiri awe hath*. "If you want to manage a Kashmiri, first kick him, and then talk to him," runs the Punjab proverb. Things were in a bad way when such a man could give all this trouble.

² Such gangs are a common feature of municipal elections, but in Amritsar they were more highly paid and organised than usual. They are "the lewd fellows of the baser sort" of Acts xvii. 5.



Manager "were battered to death with bludgeons, kerosene was poured over both the bodies and the furniture, the whole place set alight, and the mob passing on to the warehouses, broke open the doors and looted the place of its valuables bales of silk and other stuff," merchandise held as security to the value of several lakhs of rupees¹. The Chartered Bank and its British Officials were only saved by the opportune arrival of armed police. The Town Hall, Telegraph Office and Railway goods yard and the Post offices were seriously damaged; and a British railway guard and a Military Work Sergeant were beaten to death. The Religious Tract Society's depot and hall were burnt. The Zenana Hospital was ransacked in a desperate attempt to find Mrs. Easden, the lady doctor. Fortunately they missed the little cubby hole in which she was hiding, and whence, disguised as an Indian woman she was subsequently smuggled to the house of a Sub-inspector of Police. Miss Sherwood, a lady missionary who was greatly respected was overtaken when bicycling through the city. "She was beaten with sticks where she fell; she got up, ran a little way and was again felled and beaten on the ground" and left for dead. For weeks afterwards she lay between life and death. By nightfall telephone and telegraph wires had been cut, and in the endeavour to destroy the main railway line, a suburban station had been burnt. Many other similar outrages were attempted or perpetrated².

The mob was now not so much anti-Government as anti-European. "The Deputy Commissioner looked on helplessly from the civil lines at the smoke of a city, which, as he had foreseen, had passed out of his power." Late in the night troops arrived, and the Commissioner requested the Senior Military Officer to take such steps to restore order as the military situation required. Brigadier-General Dyer of the Jullundur Brigade arrived, and the next two days were spent in re-establishing control of the city and its environs. Meanwhile another element of lawlessness began to make

¹ Dyer. 155.

² P. A. R. 47; Dyer 156-7.

itself felt. At the first news of the breakdown of authority the disorderly elements of the rural population in the neighbourhood began to assemble in Amritsar with the object of looting the bazaars of the wealthy city, which was the chief distributing centre of Northern India. As the shopkeepers had been conspicuously anti-British their spoliation did not connote hostility to Government. But General Dyer was unacquainted with local politics, and when a mass meeting was held on the evening of the 13th April, in disregard of an order already proclaimed by him forbidding any procession of assemblage of more than four persons, he took a serious view of the situation. The Deputy Commissioner, who alone was in a position to appraise him of the real state of affairs, was unexplainedly absent when he marched a small body of troops to the Jallianwala Bagh, where the meeting was being held. In spite of its name of garden, the Jallianwala Bagh¹ was a dusty unturfed open space surrounded by houses. Fire was opened on the crowd at close quarters, resulting in the death of 379 persons and the wounding of others the number of whom has never been accurately known. Escape was almost impossible in that narrow space, hemmed in by high walls and its only easy exit held by General Dyer.²

The effect of General Dyer's action was electric. The news ended all danger of further disturbance in the Province. It was taken far and wide as an assurance that the hand of Government was not, as it was thought, paralysed; and all who were waiting on events hastened to declare for constituted authority, the Sikhs going so far as to confer on General Dyer the unprecedented honour of being enrolled as a Sikh in the Golden Temple.³ Horrified by the events at Amritsar, the Government of India⁴ was at last goaded into action. Its circulars emphasised the necessity of preventing the spread of disorders by all means, however drastic, and gave the officers responsible "the fullest assurance of countenance and

¹ Bagh=Garden.

² O'Dwyer, 283.

³ The Sikh Holy of Holies at Amritsar.

⁴ On April 19th, 1919.

WESTERN THEORIES AND EASTERN PRACTICE

support." Whatever might have been his views otherwise, this declared policy of the Government of India left Sir Michael O'Dwyer no option but to approve of General Dyer's action at Amritsar. Order was now rapidly restored. On the 15th April martial law was proclaimed in Lahore and Amritsar and extended subsequently to the Gujranwala, Gujrat, and Lyallpur districts. By the 17th April the most serious manifestation of disorder had abated, although wire-cutting took place as late as the 2nd May.

Events had moved too fast for the agitators. The The Afghan Amritsar outbreak was premature, and its war. drastic suppression by General Dyer was unexpected. Thus the rebellion was already over before it should have begun—at the beginning of May when Sir Michael O'Dwyer was due to retire and the Afghans to invade India. Ever since the murder of the Amir Habibullah in February 1919, the attitude of Afghanistan had grown more and more menacing. That able monarch had followed an independent but friendly policy towards British India, and during the War had withstood strong temptations to throw in his lot with Turkey and Germany. The Turco-German Mission of 1915 under Captain von Hentig, left Afghanistan in disgust on their failure to win him over, but they did succeed in forming an anti-British party of whom Nasrullah Khan, the King's brother, and Amanullah, his son, were members. When, therefore, Habibullah was murdered, the general feeling was that this party was responsible, and the suspicion was deepened when Nasrullah proclaimed himself King. But there could have been no collusion between Amanullah and his uncle, for the former, who had been acting as Governor of Kabul during his father's absence, brought the Notables and the Army chiefs together, and with their assent assumed the throne. Inayatullah, Habibullah's eldest son and heir, who followed his father's policy of friendship with Great Britain, did not feel himself strong enough to take his rightful position, and stood down first in favour of his uncle and then in favour of his younger brother.



So began Amanullah's career. As he was not the rightful King, and as he had to fear the resentment of a people enraged at the murder of his father and his own seizure of the throne, he adopted the common device of directing national feeling against a foreign enemy.¹ But the psychological moment had passed; and though an Army Headquarters, which conducted a frontier war from the distant altitudes of Simla, sublimely regardless of the fact that young British soldiers were dying of cholera for the lack of the most elementary medical comforts, did its best to assist them, the Afghans had now no hope of attaining their objective. If Waterloo was won, on the playing fields of Eton this Afghan War was lost on the dancing floors of Simla. All the advantages gained in the field were surrendered and the campaign was cut short by a humiliating peace. But though Afghanistan was now recognised as independent, it had lost an opportunity, which was hardly likely to recur, of invading an India demoralised by rebellion and disorder. On the 26th May Sir Michael O'Dwyer was able to hand over a pacified province to Sir Edward Maclagan. By the 11th June Martial law had been withdrawn from all areas except the railways, and this exception was abolished on the 25th August.²

Under martial law serious offences were tried by four Commissions specially appointed for the purpose. Minor offences were disposed of by officers (mostly military) exercising summary powers and known as Area officers, or by civil officers. On the termination of martial law, tribunals were appointed under the Defence of Indian Act to try the more serious remaining cases. A large number of persons were sentenced by the courts to various terms of imprisonment, but during the summer the Local Government took occasion to modify a considerable proportion of the sentences, and towards the end of the year two High Court Judges were appointed to revise all sentences of summary courts and many of the sentences passed by the Commissioners.

¹ Morning Post 15 Jan. 1929. See Appendix V.

² P.A.R. 49, 50. O'Dwyer 188, 290, 320-21.

Finally on the 23rd December, clemency was extended by Royal proclamation to all offenders except those condemned for the most heinous acts of violence.¹

Sublime on its hill-top the Government of India had watched the grim contest from afar; Criticisms of Martial Law and surveyed the tense conflict between methods. wild rebels and officials, worn out by heat, anxiety and lack of sleep,² with the stoic calm of a Roman Emperor and his friends gazing at a gladiatorial show. Nor was the Viceroy a Commodus that he should defile the Imperial purple by descending into the dusty arena. Reports he did receive, a very complete explanation of the events at Amritsar being furnished by General Dyer to the Military authorities, while the portentous tome compiled by the Punjab Government was a veritable dictionary of disturbance.³ Unfortunately, however, "the Government of India and the India Office, for reasons best known to themselves, never put the Press and public at home in possession of the full facts of the 1919 outbreaks and in particular issued only the most meagre and misleading summaries" of Sir Michael O'Dwyer's and General Dyer's reports of 14th April on the events at Amritsar on the 13th April.⁴

When the true facts began to leak out the British public developed a justifiable distrust for the garbled versions of the Government of India and lent a ready ear to the misrepresentations of the extremists. "Those who had fomented the disturbances and whose designs had been frustrated by the prompt measures taken, were not prepared to throw up the sponge without a further struggle, and in this they had powerful supporters in the advanced politicians in India" and England. No sooner had Sir Michael O'Dwyer left India than a violent agitation enforced by every form of

¹ P.A.R. 51.

² The natural lack of sleep due to anxiety was accentuated by Government's habit of sending cypher telegrams timed to arrive about 2 a. m. As Deputy Commissioner of Gurgaon, I was kept from 2 a. m. to 5 a. m. one morning in decyphering "Do you know the cypher code?" Some of these telegrams were undecipherable, a fact which was subsequently explained as due to the sender having made a mistake in the cypher.

³ O'Dwyer 321-2.

⁴ O'Dwyer 322-3.



calumny and misrepresentation, was set on foot in India and in England to vilify all those who had helped to crush the rebellion, and to prevent further resort to the speedy and effective methods of martial law.¹

"The Government of India and the India Office feared that this fictitious agitation might disturb the peaceful atmosphere they desired for the Reforms Scheme. Both gave way to it, and instead of boldly following up the advantage gained by the suppression of the rebellion, and setting themselves to bring home the responsibility to the authors of the conspiracy outside the Punjab, they adopted a weak defensive position. The Indian extremists, as usual, seeing that they again had the Government on the run, redoubled their attacks and sedulously spread the false and malicious propaganda" which gradually crystalised into a legend of mythical 'Punjab atrocities.' "A Secretary of State, whose main concern was to get his Reforms Scheme through Parliament, was only too ready to conciliate Indian opinion by lending an ear to the tales of the Indian politicians who had swarmed to London in the summer of 1919. As a result, the Hunter Committee of Enquiry was formed by the joint efforts of the India Office and the Government of India", the latter having "pressed but in vain, for an immediate enquiry". The committee would thus "*begin*" the investigation into the disturbances seven months *after* they had been repressed. It was presided over by Lord Hunter, a Scotch Judge, and consisted of a Judge of the Calcutta High Court, a Major-General, a Secretary to the Government of India, a British merchant, and three Indian lawyers. It was strong on the legal side, but did not contain a single member with experience of civil administration in India. Of the three Indian lawyers one had been prohibited by General Sir William Beynon from coming to the Punjab to defend some of the accused. Another two years before had in a public speech made an outrageous attack on "Sir Michael O'Dwyer, which he had afterwards reluctantly had to withdraw. It was impossible

¹ O'Dwyer 318.



that such members should approach the question at issue with an open mind. Their attitude "was rather that of advocates than of Judges,¹ and certain officers of Government who appeared before "them" were treated with less consideration than if they had been prisoners in the dock."²

The attitude of the Government of India left the Committee free to exercise its bias unchecked. It was the Government of India which had first generally approved of "all means however drastic" to suppress the rebellion, and then specifically approved of martial law as actually administered, and in particular of the conduct of General Dyer, who had been given promotion as a reward for his action at Amritsar. Apart therefore from the general responsibility of a superior for the actions of his subordinates, the Viceroy and his henchmen had definitely committed themselves in this case by their expressions of approval. But they had thrown doubt on their *bona fides* by their unsuccessful attempt to hush the matter up. Their only hope of escape lay in directing popular indignation in England and India against some other object. Fortunately the Indian politicians were only too ready to assist them in this. They were not really concerned to crush those immaculate weaklings who were already only too submissive. They had opponents more worthy of their steel. To ruin General Dyer, to befoul the bright scutcheon of Sir Michael O'Dwyer, this would indeed be a worthy revenge and a more fatal blow to British prestige than any censure passed on the opportunists of Simla. Opportunism was the characteristic of the period. In England Mr. Lloyd George, the man who had won the War with

¹ While evidence telling against British soldiers or officials was greedily absorbed by the Committee, evidence tending to shew that the disturbances were the result of a conspiracy with its headquarters at Delhi was definitely discouraged. I was in a position to prove conclusively that the district of Gurgaon, of which I was Deputy Commissioner during the disturbances, had been flooded with emissaries from the rebel headquarters in Delhi, inciting the people to revolt. Any number of witnesses of this could have been brought. But the Punjab Government cut down the number of these to six leading Indian gentlemen of the district, and the Hunter Committee refused to hear any of them for no other reason, apparently, than that their evidence would have told in favour of Sir Michael O'Dwyer.

² O'Dwyer 319.

the spirit of a hero, was now caballing with rebels and murderers against the loyalists of Ireland. As an Irishman and a Roman Catholic, Sir Michael O'Dwyer might have claimed admission to these counsels, had he not forfeited all claim to consideration by the services he had rendered to England. In the Punjab his gentle successor, Sir Edward Maclagan, had imbibed the spirit of the period. An able Secretary with little executive experience, he was necessarily an opportunist rather than an administrator, and lent himself readily to the designs of the Government of India. The change of policy first made itself apparent in the rapid release of those convicted under martial law, and it was only slowly that the protégés of Sir Michael O'Dwyer realised that sedition was now the passport to official favour. The banner of ancient loyalties was still shakily held aloft by the Chief Secretary, Mr. J. P. Thompson, whose devotion to his former chief was well-known.

“ Among the faithless faithful only he ;
 Among innumerable false unmoved,
 Unshaken, unseduced, unterrified,
 His loyalty he kept, his love, his zeal.”¹

It was due to his efforts alone that the case for Sir Michael O'Dwyer did not go entirely by default before the Hunter Committee. The Lieutenant-Governor remained impenetrably aloof. The Committee during the raw cold of a Lahore December, were accommodated in chilly tents pitched in a marshy swamp, and finished their Enquiry in a chorus of sneezes, coughs and barks ; an arrangement which was attributed by the loyalists to the Lieutenant-Governor's dislike of the Committee's methods, and by the politicians to his desire to rouse it to still greater frenzy against Sir Michael O'Dwyer.

It was clear to every intelligent observer that the Government of India required a victim and its Victims. it was not long in doubt, who the victim was to be. A straightforward, blunt, truth-telling soldier, entirely unversed in the ways of politicians, General Dyer was clearly marked out for the sacrifice. Warned by civilian

¹ Milton. Paradise Lost V.

friends that he should regard himself as a criminal on trial for his reputation, the Hunter Committee as the prosecuting counsel, and Army Headquarters and the Government of India as his treacherous employers, he persisted in giving his evidence as though one gentleman were holding a private conversation with a number of others. Censure by the Hunter Committee necessarily followed, accompanied by criticism of Sir Michael O'Dwyer and of all those officials who had been prominent in dealing with the disturbances. Still further censures by the Government of India and Mr. Montagu, the Secretary of State, came in due course ; but the Indian tiger, having tasted blood, clamoured for still further vengeance. Yet the criticisms passed on a former Lieutenant-Governor were without parallel in the history of the Province. Passed on the man who had twice saved the Punjab from rebellion, and had furnished half a million men to the Empire in its hour of greatest need, they were pregnant with evil omens for the future. The Warren Hastings of the twentieth century, the reputation of Sir Michael O'Dwyer may well be left to the future. Stern and upright, he refused to allow private interest or political opportunism to lead him from the path of duty. Fearless in upholding the right and ready to beard even the Viceroy in his lair, when the interests of the Province required it, he was ever kind and sympathetic in dealing with the difficulties of subject or subordinate.

“ For though, with men of high degree,

The proudest of the proud was he,

Yet, train'd in camps, he knew the art

To win the soldier's hardy heart.

They love a captain to obey,

Boisterous as March, yet fresh as May ;

Such buxom chief shall lead his host

From India's fires to Zembla's, frost.”¹

¹ Scott, *Marmion* III. 4.



5. THE ADMINISTRATIVE SYSTEM.

For forms of Government let fools contest,
Whate'er is best administered is best.

Pope. Essay on Man.

Much stress used to be laid by Indian officials of the old school¹ on good administration. To them the happiness of the people was the object to be aimed at, *Salus populi suprema lex*. But to a newer generation this savoured too much of reactionary autocracy. Self-government (so ran the rede) was better than good government. Democracy, sanitary dustbins, freedom to obstruct thorough-fares, compulsory education, vaccination, and the prohibition of gambling, alcoholic indulgence and vice generally in other people, were intelligible objectives but good administration was too vague an expression to have any definite meaning.

For those who used it, however, its meaning was clear enough. As in Mogul and Sikh days, so for a long time after annexation by the British, land revenue formed the most important item in the income of the Government, and the economics of the Province were considered only in so far as they borne on the subject of land revenue. Avoiding the mistakes which in Bengal and Oudh had subjected the peasantry to a hierarchy of landlords, the early Punjab administrator made the peasant proprietor the main feature in the agricultural economy of the Province; and the collection of land revenue from him in a country with a scanty and a variable rainfall brought the administration into particularly close touch with the agricultural classes and with rural problems. The delegation of executive and administrative functions through a hierarchy of subordinate officials was a legacy of pre-British administrative systems. This revenue staff (as it was called) performed all those miscellaneous executive functions which the growth of departmentalism had not allocated to other departments. For this purpose the Province was divided into 28 districts, each in charge of a Deputy Commissioner. These

¹ O'Dwyerians, they were afterwards contemptuously nicknamed, Sir Michael O'Dwyer having been preeminently a great administrator.



districts were grouped into five divisions, each under a Commissioner. The Commissioner exercised control over the revenue officers and revenue courts of his division and was himself subordinate to the Financial Commissioner, who exercised control in all matters connected with land, excise and income-tax administration, and was also the final appellate authority in revenue court cases.¹

But the hub round which all this official hierarchy revolved was the Deputy Commissioner of the district. As Collector he was head of the land revenue organisation and as District Magistrate he exercised general supervision over the inferior criminal Courts. His land revenue subordinates kept him in touch with every inch of his territory. He was the head of the Police in his district, who were however also under Inspector-Generals of their own department for technical and disciplinary purposes. This organization in the first place served its peculiar purposes of collecting the land revenue and of keeping the peace. But, because it was so close-knit, so well-established and so thoroughly understood by the people, it simultaneously discharged easily and efficiently an immense number of other duties. It dealt with the management of indebted estates, loans to agriculturists and famine relief. Because it controlled land revenue, which depended on agriculture, the supreme interest of the people, it naturally served also as the general administration staff. The land revenue officials, and to a much more limited extent the police, conveyed the orders of Government to the people in a hundred ways. Several other specialized services existed with staffs of their own, such as the establishments for irrigation, roads and buildings, agriculture, industries, factories, and co-operative credit. These were controlled not by the Deputy Commissioner but by their own departmental heads; who may be regarded as a different set of strings connecting the Government with the people. But in varying degrees the Deputy Commissioner influenced the policy in all these matters, and he was always there in the back-ground to lend his support, or, if need be, to mediate between a specialised service and the people.²

¹ PAR 263; LFR 221-2.

² PAR 67.



With such multifarious responsibilities, the Deputy Commissioner's time was never his own. "He had continual correspondence on a multitude of matters with all departments; as Collector he had to arrange for the collection of all kinds of revenue and to determine when it should be suspended or remitted, to supervise the subordinate revenue courts and establishments, to hear certain original cases and decide appeals; as District Magistrate he arranged for the disposal of criminal work, tried the more important cases himself, and heard appeals" from the orders of Tahsildars,¹ and other second and third class magistrates. He had to inspect the local jail, the factories, liquor and drug shops and those licensed for the manufacture of arms, fireworks and ammunition. As Registrar of the district he supervised the registration of documents recording agreements between parties who wished to give their agreements an official sanction, incidentally controlling the work of the sub-registrars, whose offices he had frequently to inspect. The innumerable district accounts and the money in the headquarters and tahsil treasuries had to be continually checked by him and he was held responsible for any defalcations. As President of the District Board, it was his duty to arrange for the upkeep of hospitals, schools, roads, buildings, roadside trees and minor canals; as President of the headquarters' municipal committee he had somewhat similar duties, and he also controlled the other municipalities in the district. The large establishments of revenue officials and office clerks had to be selected and appointed by him, as also had the *zaildars*,² village headmen and watchmen; it was his duty, too, to reward, punish or dismiss them when necessary.³

Nothing of importance could happen in the district which it was not his duty to keep under observation. The vicissitudes of trade, the administration of civil justice, and progress of public works all affected materially the interest of the classes of which he was the constituted guardian. Officious interference in matters beyond his

¹ p. 69.² p. 69.³ Buck 16-17.

immediate control were to be avoided, but temperate and intelligent remonstrance against anything which he saw to be wrong was one of his most important duties. If he showed tact and discretion, and kept on good terms with the officers of other departments employed in his district, he was in a position to make representations to them in cases where the activities of their departments militated against the public welfare.¹

The qualities required for successful district administration were not easily found united in one person. Sympathy with the people and knowledge of their language, patience and promptitude, tact and firmness, accessibility without familiarity, a shrewd appreciation of character with a readiness to repose confidence where it was due, demanded the ripe experience of a man of the world. But these were useless unless a Deputy Commissioner had also a thorough knowledge of the details of all branches of his work, and great capacity for personal exertion with a willingness to hand over to trustworthy subordinates a large share of his administrative duties, while maintaining complete control over their actions. The Deputy Commissioner who insisted on doing everything himself was sure to leave many things undone, and to fritter away on small details time that should have been devoted to more important matters. To avoid the reputation of being unduly influenced by his immediate subordinates, it was necessary to define carefully, the limits of the responsibilities of each, and this required a thorough acquaintance with every branch of district work, and of the powers and capacities of the district establishment.² The principles laid down by Bacon for those who in his time were set in authority in England were applicable no less to Deputy Commissioners in the Punjab. "Preserve the right of thy place, but stir not questions of jurisdiction and rather assume thy right in silence and *de facto* than voice it with claims and challenges. Preserve likewise the rights of inferior places; and think it more honour to direct in chief than to be busy in all. Em-

¹ L.A.M. 212.

² L.A.M. 214.

brace and invite helps and advices touching the execution of thy place ; and do not drive away such as bring thee information as meddlers, but accept of them in good part. The vices of authority are chiefly four : delays, corruption, roughness, and facility. For delays ; give easy access ; keep times appointed ; go through with that which is in hand and interlace not business but of necessity. For corruption, do not only bind thine own hands or thy servants' hands from taking, but bind the hands of suitors also from offering. For integrity used doth the one ; but integrity professed, and with a manifest detestation of bribery, doth the other. And avoid not only the fault, but the suspicion. Whosoever is found variable and changeth manifestly without cause, giveth suspicion of corruption. Therefore always when thou changest thine opinion or course, profess it plainly and declare it, together with the reasons that move thee to change and do not think to steal it. A servant or favourite, if he be inward, and no other apparent cause of esteem, is commonly thought but a byway to close corruption. For roughness, it is a needless cause of discontent : severity breedeth fear, but roughness breedeth hate. Even reproofs from authority ought to be grave and not taunting. As for facility it is worse than bribery. For bribes come but now and then, but if importunity or idle respects lead a man, he shall never be without."¹

To ensure continuity in district administration every Deputy Commissioner was bound, when making over charge, to hand to his successor a confidential memorandum calling his attention to the most important features of the district administration, and supplying him with notes as to the chief matters which were pending and on the character and capabilities of his principal subordinates. Much information regarding the district lay ready to hand in the District Gazetteer and in the Settlement and Assessment Reports. The Gazetteers in particular were a perfect mine of useful information on the history, topography, and

Aids to rapid acquisition of knowledge of a district.

¹ Bacon, Essay XI.



economics of the district, supplemented by valuable statistical statements. Brought up to date at each settlement, they were supposed to be kept up to date by the Deputy Commissioner's notes in his interleaved copy, a rule which was unfortunately more honoured in the breach than in the observance. If these sources of information were supplemented by diligent personal enquiry and systematic touring a Deputy Commissioner would soon acquire a thorough knowledge of his district. When in camp his main object would be to get to know the people, and to give them an opportunity of knowing him. For this purpose he would see the people in their own villages, encourage their visits, and talk with them frankly, so as to ascertain what mainly occupied their minds and the point of view from which they regarded it.¹

The Deputy Commissioner's direct Assistants were of two kinds, Assistant Commissioners who The Deputy Commissioner's Assistants. were members of the Punjab Commission and Extra Assistant Commissioners² belonging to the Provincial Civil Service.³ To one of them, the Revenue Assistant, was allotted the special supervision of the land revenue work of the district. Owing to the fact that the Punjab was originally a frontier province, the Punjab Commission was recruited from the Indian Army as well as the Indian Civil Service. With the separation of the North-West Frontier Province however the Punjab ceased to be a frontier province and recruitment from the Indian Army was therefore discontinued.

From the beginning Indians as well as Europeans were employed as Assistants to Deputy Commissioners under the title of Extra Assistant Commissioners, but Indians were debarred from rising to higher rank at first unless they got into the Indian Civil Service through the open competition in England. The experiment of throwing open high appointments

¹ L.A.M. 215, 219, 836.

² A sigh may be heaved in passing at the priggishness which substituted abominations such as Extra Assistant Commissioner (bastards begotten by a worn-out Saxon sire on a meretricious Latin dam) for the admirably concise terminology of the Mogul Empire.

³ Afterwards known as the Punjab Civil Service.

in the Commission to Indians generally was made under an Act of Parliament of 1870¹ constituting the Statutory Civil Service. But the experiment was not successful and the investigations made by the Public Service Commission of 1886 led in 1893 to the constitution of a Provincial Civil Service, members of which were eligible for a certain number of those appointments which had hitherto been reserved for members of the Indian Civil Service or Military Officers of the Punjab Commission. These "listed" appointments were the means of giving to the more able and deserving members of the Provincial Service the responsible employment in the administration of the country which the Statutory Civil Service was originally designed to supply. The Provincial Service was originally composed of seven grades of officials still known as Extra Assistant Commissioners and available for judicial or executive work, but the principle of separating judicial from executive functions and the necessity of specialisation in training led to the gradual separation of the judicial and executive branches in the highest six of the seven grades. The pay of each grade was the same in both branches, while the members of the executive branch continued to be styled Extra Assistant Commissioners those of the higher posts of the judicial line were now known as Extra Judicial Assistant Commissioners, and of the lower as Subordinate Judges. The Provincial Service was recruited from the Tahsildar and Munsif establishments (these being the names of the subordinate executive and judicial officers); from selected members of the various departments; and by direct appointment either on nomination or by competition.²

Each district was divided into three or four tahsils, District off- each administered by a Tahsildar with an cials. assistant known as Naib-Tahsildar, to help him. Each tahsil was divided into circles or *zails* over each of which a *zaildar* was appointed. Each *zaildar* was selected by the Deputy Commissioner from among the

¹ Vic. 33 Cap. 8.

² P.A.R. 74-5.

leading landholders of his *zail* and thus formed a very valuable unofficial link between the administration and the agricultural classes. Each *zail* was made up of some ten to twenty villages, the village constituting the basic unit of revenue administration.

At the headquarters of the district a large clerical establishment was immediately under the orders of the Deputy Commissioner. Of these the most important were the Head Clerk, the Superintendent of the Vernacular Office and the Sheriff.¹ "The Head Clerk had charge of the English Office and all English correspondence; he drafted letters and prepared files and reports for submission to the Deputy Commissioner at the close of each day's work; he had under him a Record-keeper (who looked after the office library, the English files and records) and three or four other clerks. The Superintendent of the Vernacular Office (always called "S.V.O." for short) was subordinate to the Head Clerk: his duties consisted in supervising the clerks in his office and all the vernacular offices, in going through vernacular files and reading out the gist of important ones to the Deputy Commissioner, in preparing abstracts of others and making notes for reports." With the extension of the knowledge of English, vernacular work became more and more synonymous with land revenue work and the S.V.O. tended to become the Deputy Commissioner's legal remembrancer on matters connected with the land revenue administration. Under him, but not very much under him, was the Sheriff¹ who kept the accounts of diet money and travelling expenses paid to witnesses and other money paid into or out of court. He arranged for the service of summons and the despatch and receipt of the post. He also received property taken from prisoners under trial and articles or money attached by or deposited in the courts and had general charge of the office buildings and the camp equipage. It was his duty to check the contingent accounts submitted by assistant sheriffs² and vernacular clerks³ from outlying tahsils and to remit them through the treasury such sums as

¹ *Nazir*.

² *Naib-nazir*.

³ *Muharrir*.



they had spent out of their permanent advances. He generally had an assistant,¹ and was, perhaps, the hardest worked official in the district.²

The efficiency of the district administration depended to a large extent on the capacity of the Deputy Commissioner to exercise a proper supervision over these clerks. Always near him, and able to gauge his weaknesses to a nicety, it lay in the power of the Head Clerk and the S. V. O. to inflame him against an enemy by subtle suggestion or to cover up a delinquent by discovering that the requisite file was "not forthcoming." The mass of English and vernacular orders which were put up by them for signature defied systematic checking, and when a Deputy Commissioner was weak, tahsildars and even the higher assistants found it necessary to pay court to these jacks-in-office. But while the sycophantic smiles of these two were ever before the Deputy Commissioner, the Sheriff modestly kept himself in the background, the Deputy Commissioner being generally reminded of his existence by a particularly large embezzlement, the blame for which the acting Sheriff would always lay on his predecessor.

Prior to the year 1875 the officers of the administration combined within the scope of their Judicial and executive duties all judicial and executive functions. This arrangement had been in force since the annexation of the Punjab. But the rapidly increasing calls on the time and energies of administrative officers, and the increase of judicial work that accompanied the development and advancing prosperity of the country during the decade following the Mutiny enabled the money-lending classes to reinforce on the grounds of administration expediency their political arguments for the separation of judicial from executive functions. Accordingly in the year 1875 measures were introduced to relieve Tahsildars, Deputy Commissioners and Commissioners of much of their judicial work. A Munsif was posted to each tahsil where the number of suits was large. In twenty-three districts

¹ *Naib-nazir*.

² *Buck* 20-21.

the judicial work of Deputy Commissioner was transferred to Judicial Assistants; and two Additional Commissioners, at Lahore and Jullundur, respectively, were appointed to aid in the disposal of civil and criminal appeals and of original criminal trials in serious offences.¹ This scheme afforded relief to the Commissioners as a body, and in less than seven years a further step was taken in the same direction. The ten Commissionerships were reduced to six and, except in the Frontier districts, Commissioners were entirely relieved of civil and criminal judicial work, though not of revenue appellate business. Sessions Judges were appointed for the more important criminal work, though the Deputy Commissioner, remained the District Magistrate. His civil powers were withdrawn altogether in fourteen districts and in the remainder were reduced in practice to the exercise of control and the distribution of business.² But Assistant Commissioners still continued to do judicial work, a training which afforded an effective antidote to the autocratic proclivities engendered by a too exclusive concentration on executive work. It taught the young officer from the start, "to weigh evidence, to regard every question as having two sides, and to exercise his judgment impartially and judicially."³

But the very merits of this system only rendered Separation of it the more obnoxious to the politician. In his judicial and eyes it was eminently desirable that executive work. officers should be hasty and impetuous, continually falling into legal pitfalls which would lay them at the mercy of the lawyer; and that judicial officers should be divorced from all knowledge of the extraordinary diversities of social, racial and religious environment which prevailed in different parts of the Province. Already the Chief Court had earned for itself the title of the "money-lender's shop,"⁴ and with its progressive separation from the executive a similar partiality to the money-lender be-

¹ P.A.R. 70.

³ O'Dwyer 30.

² P.A.R. 71.

⁴ *Bania ki dukan*.



came apparent in the lower judicial staff. Failure in the executive was the chief qualification for judicial appointment, and the judiciary was mainly manned by exiles seeking to revenge themselves on the executive, which had cast them forth, by disorganising its machinery as far as possible. The Subordinate Judges were drawn mainly from the money-lending classes and as the sympathy of the executive with the rural classes developed, the money-lenders turned more and more for help and protection to the Chief Court. The clamours of the politicians led gradually to the withdrawal of civil judicial work from the remaining Deputy Commissioners. The increase in miscellaneous executive and political work due to the War and the disturbances that followed, considerably diminished the amount of time that Deputy Commissioners could spare for original criminal work and much of this work began to be entrusted to Magistrates with special powers.¹

In the district, as in the Province, the Administration was autocratic, and it is one of the chief defects of autocratic rule that it tends to become bureaucratic. A highly efficient autocrat, a Lord Curzon for instance, or a Lord Kitchener, multiplies his activities in every direction, requiring more and more secretarial staff to cope with his increasing duties. But the staff which is easily controlled by its creator, soon usurps the authority of his feeble successors, and becomes itself a many-headed autocrat, restrained by no sense of responsibility. Moreover, British administration in India was a specialized product, which had been developed to suit the purposes of a handful of administrators of a foreign race in the supervision of a large native establishment governing "a vast indigenous population. The members of this handful needed long periods of leave in order to recuperate in a cooler climate, so that the organization had to provide for changes in the tenure of appointments every three or four years. But in fact, owing to exigencies of one sort or another such changes were more frequent. It was not unusual for an English official at some period or other of his

¹Under section 30 of the Criminal Procedure Code, P.A.R. 73.



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service to be moved from appointment to appointment not every three or four years but every three or four months. In some localities this liability to change had extended to the Indian staff also " so that the supervising staff generally was more or less in a state of flux. The machine had therefore to be such that any member of the staff, wherever he might be and for however limited a time, might be able to turn his particular handle and produce the outturn required ; without dependence on the establishments under him, as it was his business especially to direct and control their work. These requirements put a premium on uniformity, which prevented time being wasted in learning new codes or systems of work ; but which carried with it the disadvantage that local custom had to be adapted to the code, when the code could not be adapted so as to cover all variations in the custom. They involved an elaboration of checks which could be more or less mechanically applied, and they necessitated keeping a record in writing of as many official transactions as possible, so " that when an official joined an appointment he might be able to pick up the threads of the questions with which he had to deal. Further in order that instructions may not be misapplied by people " whose knowledge of English was limited, " the rules of guidance had to be such as would leave the least possible opening for misinterpretation ; whilst all work done had to be registered so that it might be easily checked."

Again, the statistical net was thrown wide, because it was not easy to forecast precisely what information would afford a practical return whilst a maximum of information was needed by administrators who were not natives of the country. There resulted an accumulation of correspondence, reports, registers, returns of work done, records, statistical compilations, codes, rules, and circular orders, of which the tendency was to further elaboration. For when any defect had been brought to notice, it was natural to add a column to a register or a paragraph to a rule in order to provide against the recurrence ; while it would have been a formidable undertaking to determine what detail could be omitted without



sacrificing some check for which it might have been introduced or forfeiting information of some potential value. Naturally, as the administration grew more intricate more checks were required; whilst the establishments resisted the reduction of work and preferred their own expansion, with all the attendant possibilities of finding employment, for friends and relations.¹

The increasing power of the bureaucracy was also due to the unwieldy size of the British administrative units. "There is an efficiency unit in government as there is an economic unit in industry; the limit being that at which the business of the state can be conducted with the maximum of economy in the overhead establishment, combined with the maximum of knowledge and despatch, and the maximum of advantage to be gained from the organization of large rather than small man-power and resources."² The British Province was twice the size of the Moghul Province and the division and the districts were respectively three and eight times the size of the corresponding Moghul units.³ Now experience had shown that even the Moghul units were unwieldy, and under British rule, though the development of communications had simplified, legal and doctrinaire theories had complicated administration to a far greater extent. Moreover two administrative units, the division and the tahsil were practically ceasing to function. It is true that a small bureaucracy grew up round the Commissioner, and the Superintendent of his office made a handsome income out of the transfers of Tahsildars and Naib-Tahsildars, which were (nominally) made by the Commissioner.⁴ But it was nothing to the income made by the Chief Secretary's subordi-

¹ *Firmness* 55-7.

² *Firmness* 65.

³ *L.F.R.* 115 notes.

⁴ In 1915 when I was Assistant Commissioner in charge of the Sonapat Sub-Division of the Rohtak District the Tahsildar came and told me that he was going to be transferred. I wrote to the Commissioner, who replied that he feared that the transfer was unavoidable. The Tahsildar then asked for four days' leave, went and interviewed the Commissioner's Superintendent and got his transfer cancelled, though the Commissioner himself had said it was unavoidable.



nates from the transfers of Extra Assistant Commissioners. Moreover, as far as the Commissioner had any power it was purely obstructive. The post was generally held by lazy men at the end of their service, who did not want to be bothered, and disliked energetic Deputy Commissioners who raised troublesome questions in the interests of efficiency. Thus there was a tendency (which became pronounced under Sir Michael O'Dwyer) for the Provincial Government to deal direct with the Deputy Commissioners, ignoring that fifth wheel in the coach, the Commissioner. Even stronger was the tendency to obliterate the smallest administrative unit, the Tahsil. The Tahsildar had failed to collect an effective bureaucracy round him, he was perpetually bullied by the Deputy Commissioner's Office and by officials of other departments, and was always liable to transfer by the Commissioner's Superintendent. The village as a vital organism had long since ceased to function¹ and consequently the only two effective units of administration were the district and the province, both so large as to be unwieldy.

Provincial administration was conducted by a Secretariat which "struck terror into the heart of the rough and ready district official, who cared more for getting the work done than for sending up a punctual and polished report of how he had done it."² In the Punjab immediately before the introduction of the Reforms the direct administrative functions of Government were performed by the Lieutenant-Governor through the medium of the Secretariat, which consisted of three executive Secretaries, styled the Chief, Revenue and Financial Secretaries respectively, with three Under Secretaries, a Registrar and the Mir Munshi (the last being a sort of S.V.O. to the Lieutenant-Governor). When the War was in progress an Additional Secretary, afterwards known as the Home Secretary, was added. In the Public Works Department there were also three Secretaries—the Chief Engineers—one in the Buildings and Roads Branch and two in the

¹ p. 14.

² O'Dwyer 48.



Irrigation Branch, the former assisted by an Under and an Assistant Secretary, and the latter by two Under-Secretaries and one Assistant. The heads of the Police and Educational Departments were also Under-Secretaries to Government in their respective Departments.¹ These were however but the figure-heads for a vast army of clerks, who being permanent, tended to exercise more control over the administration than their transitory heads. Behind the imposing well furnished chamber, in which the Chief Secretary frowned on his visitors, was a disorderly warren of offices, inhabited by those who were for many purposes the real rulers of the country. Their superiors mainly acted on precedents, and it lay with these subordinates to decide whether or not a precedent should be forthcoming. The Chief Secretary was no Hercules that he should himself endeavour to cleanse this Augean Stable or he would have found that within this maze there was a still more intricate maze, the Record Room, an unclassified limbo whither files descended most of them never to return. There they accumulated under a covering of dust and cobwebs, a process feebly checked by fitful efforts at "destruction." The real remedy for this chaos, the introduction of a proper system of filing, based on scientific classification, was never even attempted, and any suggestion of improvement was stoutly resisted by the clerks whose importance depended on their being the only guides through this trackless waste of paper.

In contrast with, and in many matters independent of, the Punjab Government, as the Commissioner. above organization was denominated, was the Land Revenue Department. On the abolition of the Board of Administration in 1853 a Financial Commissioner was appointed as chief authority in the Revenue Department and in 1865 a Settlement Commissioner was added, to control settlement operations under the supervision of the Financial Commissioner. The substitution of a second Financial Commissioner for the Settlement Commissioner in 1884 marked the attempt to assimilate the work of land

¹ P.A.R. 61.

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revenue assessment to ordinary district work,¹ and the restoration of the Settlement Commissioner in 1897 marked the failure of that attempt. In 1910 a second Financial Commissioner was again substituted for the Settlement Commissioner and control over both settlements and excise administration was to some extent entrusted to the Commissioners of divisions, an attempt to revivify the Commissionership which was hardly successful. The Financial Commissioners, besides being the highest Court of Revenue jurisdiction, were the Heads of the Departments of Land Revenue and of Agriculture, and controlled the Director of Agriculture, the Director of Land Records, the Registrar of Co-operative Credit Societies, and, in his relations with the agricultural and pastoral population, the Conservator of Forests.²

But the bureaucracies of the district and even of the province were mere brushwood when compared with the dense jungle growth of the Government of India Secretariat. The British Government of India developed out of a trading corporation, the East India Company, and through it inherited and exaggerated the centralised characteristics of its Mogul predecessor. The whole system of Government was operated by a lever which Parliament committed to the hands of the Secretary of State. But the system itself centred in the Governor-General³ in Council, to whom a large measure both of initiative and of decision was left, and who exercised in theory complete control over the Provincial Governments. From the outset the burden of government in India was heavy. The political disintegration which preceded British rule utterly destroyed any incentive to material improvement or progress by laying its results at the mercy of the first raider. It was inevitable, therefore, that when the government of the country was assumed by the vigorous and practical British race they should have formed a conception of their responsibilities towards the people wider than that accepted for their own land.⁴ Like its predecessors the

¹ L.F.R. 273-8.

³ i.e., the Viceroy.

² P.A.R. 262.

⁴ P.A.R. 56.



Government claimed a share in the produce of the land ; and it exercised the right of periodical re-assessment of the cash value of its share. In connection with its revenue assessments, it instituted a detailed cadastral survey and a record of rights in the land. In the Punjab it restricted the alienation of land by agriculturists to non-agriculturists. Through a Court of Wards it undertook the management of landed estates when the proprietor was disqualified from attending to them by age, sex or infirmity, or occasionally by pecuniary embarrassment. In times of famine it undertook relief works and other remedial measures upon an extensive scale. It managed a vast forest property and was a large manufacturer of salt and opium. It owned the bulk of the railways of the country, being directly responsible for the management of a considerable portion of them ; and it had constructed, and maintained most of the important irrigation works. It owned and managed the postal and telegraph systems. It had the monopoly of note issue, and it alone could set the mints in motion. It acted to a large extent as its own banker. With the co-operation of the Secretary of State, it sought to steady the rate of exchange as between India and the outside world, through the action of the India Council's drawings. It lent money to municipalities, rural boards, and agriculturists, and occasionally to the owners of historic estates. It exercised a strict control over the sale of liquor and intoxicating drugs not merely by the prevention of unlicensed sale, but by granting licenses for short periods only, and subject to special fees which were usually determined by auction. In India, moreover, the direct responsibilities of Government in respect of police, education, medical and sanitary operations, and ordinary public works were of a much wider scope than in the United Kingdom.¹

The powers of the Provincial Government were formerly exercised under considerable limitations. At the outset, it is obvious that their responsibility for the entire country constrained the

Limitations of Provincial powers.

¹ P.A.R. 57.



Government of India to keep some functions of Government entirely in their own hands. Connected with defence was the diplomatic business of relations with bordering Asiatic powers and with this again the administration of bastions of territory like the Frontier Province and British Baluchistan. There was also the business of political relations with the numerous Indian States, which was mainly, though not yet wholly, the sole concern of the Government of India. In a separate category came the administration of tariffs, the currency and the exchanges, and the debt, and also of the great commercial services like the post office and the railways, all of which concerned the whole country. Again the Central Government controlled the business of audit and accounting, and had maintained it on a uniform system for the whole country.¹ But in many administrative functions also the Government of India exercised a supervising and appellate authority. On the whole, however, while generally contented to lay down general principles and watch the effect given to them, the Government nevertheless kept a very tight hand upon the creation of new appointments or the augmentation of salaries. This control was exercised by means of complicated codes of instructions, executive directions, and financial restrictions.²

Obviously a Government which endeavoured to control the details, not only of the administration, but even of the daily life, of a vast sub-continent, was bound to make many errors both of omission and of commission. That these errors were patent to its own subordinates, and to the people as a whole, was a matter of indifference to the Government of India, Parliament and the Secretary of State it did fear, and took every possible step to prevent criticism reaching their ears. For this reason those officials who were in contact with realities and were in a position to point out the practical results of the theories so beautifully woven in the Simla Secretariat, were steadily discouraged from giving expression to their opinions. On one occasion, "at a public and un-

¹ P.A.R. 59.² P.A.R. 59, 60.



official meeting in which all men present were there as simple citizens, and at which discussion had been invited," when an official¹ had the temerity to make a statement which, though the whole press of India, English and vernacular, endorsed it as true, was yet disagreeable to the Government, "he was soon afterwards compelled to apologise for having, whilst a Government servant, used expressions which were regarded as an attack on the Government."² Few officials, however, were willing to sacrifice their careers in the hopeless attempt to amend the errors of a Government, which required more drastic treatment than friendly criticism; yet many in their hearts would have agreed with the dictum of the same official.—"So long as the Government of India is practically an irresponsible despotism, and the Indian public merely a powerless mass of uninformed and inarticulate tax-payers, muddling, misrepresentation and waste in the conduct of India's foreign affairs will not cease, and high-placed blunderers in authority will never be called to account. Until some force in India arises with the power, the will, and the ability necessary for securing a common-sense management of affairs, business-like prudence will not always be practised."³

The ruthless suppression of reasonable criticism threw
Collapse of the the function of opposition to unwise Govern-
bureaucratic ment measures into the hands of those
system. who were the declared enemies of the British.

The Hindu seditious clique whose vocal instrument was the Indian National Congress, enlisted the sympathy of many, who would not otherwise have been attracted to it, by the fact that through it alone could Government be made to listen to any criticism of its actions. Impartial observers from England, too, were disinclined to help in eternally bolstering up a Government, which refused to tackle seriously the problems of agricultural debt,⁴ or of urban sanitation. Even Simla itself, under the very

¹ Thorburn, the fearless protagonist of the Punjab peasants (p. 25).

² Thorburn P.P.W. 339-40.

³ Thorburn P.P.W. 339-40.

⁴ See L.F.R. 332.

nose of the Viceroy, with a natural drainage fall to gladden the heart of any Sanitary Engineer, stank with a sanitary system¹ which would have been condemned as hopelessly antiquated by Servius Tullius.² The use of electric light to brighten the long winter nights, and of electric fans to cool the long summer days of the Punjab was discouraged by ill-considered legislation.³ As long, however, as the people of India were the only sufferers, public opinion in England was fairly indifferent. But the mismanagement of the Mesopotamian campaign, by the chocolate soldiers of Simla, emphasised by their failure to provide the necessary medical comforts for the sick and wounded, and their obstinate refusal to remedy the error when it was pointed out to them by a courageous medical officer, gradually enlightened the British public as to the nature of bureaucratic rule in India. Every soldier invalided home cursed the frock-coated bureaucrats and the red-tabbed carpet knights who were responsible for his misery. Like the French monarchy of the eighteenth century, the bureaucracy had lost the confidence of the public in India, of its own subordinates and even of itself. It was consequently in no position to offer any effective opposition to the proposals which were now put forward for its reformation.

6. THE REFORMS SCHEME.

Pleasant it is for the Little Tin Gods

When great Jove nods ;

But little Tin Gods make their little mistakes

In missing the hour when great Jove wakes.

—*Kipling Plain Tales from the Hills.*

¹ I refer to the unpleasant habit of removing night-soil in baskets.

² King of Rome, about 600 B.C. The Cloaca Maxima, the great Roman sewer, ante-dated him considerably.

³ When in charge of the Sonepat Sub-Division in 1917 I induced a local factory-owner to use the power thus generated to light the street and shops of the local market. I dared to do this in anticipation of the necessary sanction under the Electricity Act, which was really intended to apply to large electrical schemes involving dangerous voltages, and not to small ventures such as that at Sonepat. For this I was publicly reprimanded by the Commissioner, all the electric wiring and fittings were forcibly removed, without any compensation to the factory owner, who was considered my accessory in crime. For three nights only Sonepat glowed with electric light, an amenity of civilisation, which it had never experienced before, and has never known since (1927).



The weakness of the Government of India may be gauged from the farcical nature of the attacks to which it yielded. Mrs. Besant the wife of an English clergyman, from whom she had been legally separated, had been elected leader of a movement whose followers' religion emphasised above everything the wifely duty of submission. "In September 1916, Mrs. Besant's Home Rule League was formed; a few weeks later nineteen members of the All-India Legislative Council issued their manifesto demanding sweeping political changes. In December, 1916, the National Congress and the Muslim League," a Muhammadan version of the Congress "agreed on a common programme which included the support of the Home Rule propaganda. No doubt these demands were stimulated by the knowledge that the British Empire was engaged in a desperate struggle for existence, that the British Government had accepted President Wilson's doctrine of self-determination for nationalities who had rebelled against oppressive alien rules, and that a large section of British politicians, with whom a high sounding formula takes the place of knowledge and experience, would support their claims. All this time the authorities in Simla were busy working out their own projects for satisfying the demands of the advanced Indian politicians," in whose voice they professed to recognise the voice of the people.

The entry of Mr. Lionel Curtis on the scene is a tribute to the importance of self-assurance in human life. With no qualifications whatever for the task (he was not even a Member of Parliament), the Editor of the Round Table propounded his panacea for Indian constitutional ills, a "scheme for a dual government, partly responsible to the Secretary of State and Parliament, partly responsible through Indian Ministers to an elected assembly."¹ Never, since the time of Titus Oates, had pure brazened impudence so successfully impressed so many people for so long a time. While his less intelligent fellow-countrymen were being mercilessly

¹ O'Dwyer 373.

slaughtered in the holocaust of the Somme, Mr. Lionel Curtis was "engaged in discussing the lines of Indian Reforms with certain India Office officials. Between them they evolved the Dyarchy, though all concerned seem later to have repudiated their share in its parentage; and Mr. Curtis came to India with an informal mission to sound the authorities as to its acceptance. Having failed to impress the provincial authorities, he addressed himself a wider audience. He expounded the merits of the scheme in a series of open letters to the people of India,"¹ the naïvité of which soon convinced Indian politicians that Mr. Lionel Curtis might prove a useful tool.

About this time,² Mr. Montagu, the new Secretary of State for India, announced that the policy of His Majesty's Government was the increasing association of Indians in every branch of the administration, and the gradual development of self-governing institutions with a view to the progressive realisation of responsible government of India as an integral part of the British Empire. He promised to "pay an early visit to India to discuss with all concerned how effect should be given to the policy."³ Accordingly, in November 1917, he arrived in India with his Delegation, which included a few well-known public men but none with any knowledge of Indian conditions and some of his India Office staff, who had been associated with Mr. Curtis in evolving the Dyarchy. They sat for months at Delhi, in close consultation with the Viceroy and his Executive Council, patiently burrowing through the mass of written proposals put forward by the various political organisations, and hearing witnesses in support of them. "The Indian public men had the time of their lives in expounding to a sympathetic Secretary of State and a patient Viceroy the defects of the British bureaucracy and in propounding cut-and-dried formulas for the government of the Indian Empire. Men who had failed hopelessly in the management of a school, a newspaper or

¹ O'Dwyer 374. ² 20 August 1917. ³ O'Dwyer 370.



a petty municipality were ready with schemes to run an Empire. Some of them enjoyed their new found importance so much that on Monday they would be found representing a Hindu Sabha with one set of proposals, and on Tuesday in a landlords' delegation advocating something quite different." Mr. Montagu took them as seriously as they took themselves. "Now and again Heads of Provinces were called away from the pressing duties of administration and the then all-important task of raising man-power for the Army, to assist in" discussions, whose futility was to them only too apparent.¹

Mr. Montagu had timed his offensive to coincide with the last German offensive in the West, in England. at a time when the fate of the Empire hung in the balance, and the attention of everyone else was turned to the great struggle then proceeding in France. When the War ended, he transferred his attack to the Home front. Numbers of extreme politicians hastened to England where they "had free access to the India Office, and through their influence there and with certain supporters in the Labour Party did much to give the Bill a shape favourable to their pretensions. They had organisation, money and influence at their back, and they were masters in the arts of political intrigue. At the same time the Punjab rural classes dimly realising how their interests were threatened; but having neither funds, nor organisation, nor influence with those in authority, asked for the assistance of Government to send a deputation to represent their case to the India Office and Parliament. The request was curtly refused; a suggestion that the views of the scores of Indian military officers then assembled in London for the Victory celebrations should be ascertained was summarily rejected, and not a single Indian representative of rural interests appeared before either the India Office or the Parliamentary Committee. This may have been clever politics, but it cast a slur on the British reputation for honesty and fair play."²

¹ O'Dwyer 376-377.

² O'Dwyer 381.

"In the summer of 1919 a Joint Committee of The Reforms both Houses of Parliament was appointed to Bill passed. investigate and report on the whole question. Mr. Montagu got himself and his Under Secretary of State, Lord Sinha, appointed to that Committee, and secured a majority of members favourable to his particular views on Indian reform."¹ At the close of 1919 "the Reforms Bill was hurried through a Parliament in which not one in fifty understood its complicated provisions." The object of this haste (so Mr. Bonar Law admitted in the Commons) was the passing of the Bill before the 1919 session of the Congress at Amritsar, in the hope that it might allay the growing violence of extremist agitation. By such specious reasoning Parliament was induced to pass the Bill which was to settle the future fate of India.²

The Reforms Scheme provided Parliamentary institutions for the provinces and India as The British Services in a whole. Responsible government through India. Ministers was to be exercised as regards certain "transferred" administrative heads, the remainder being "reserved" for the direct administration of the Governor in Council. Finally the hitherto mainly British services were to be further Indianised till the proportion of Indians should reach about 50 per cent. It was the last proposal that created most alarm among the British services. Ever since Clive had laid down the principle that honest and efficient administration necessitated well-paid public servants, the Indian Civil Service had taken rank as the finest of its kind in the world; and the other British services in India had ranked high in proportion. The Collector of Bogley Wollah ruffled it with the best of the bucks of the Regency,³ and in Macaulay's time, when money was far above its pre-War value, an Indian Civilian could easily save more than enough to double his pension of £1,000 a year.⁴ Indian careers became less attractive when the value of the rupee

¹ O'Dwyer 389.

² O'Dwyer 391.

³ See Thackeray. *Vanity Fair passim*.

⁴ Macaulay; Essay on Clive.

fell with the depreciation of silver ; and the relief afforded by a stabilised rupee was set off by the steady (though slow) rise of prices at the beginning of the Twentieth Century. By 1900 the Home Civil Service had become definitely more attractive to examination candidates who had the option of selecting it. The extra pay earned by service in India barely sufficed to meet the extra expenditure entailed in sending a family to the hills in the hot weather and educating children in England. Discontent was already rife when the War broke out, a discontent which was accentuated in the Punjab, where (for purely adventitious reasons) the pay was considerably less than that in other provinces.

With the out-break of war these murmurs ceased. Loyalty of the Services during the War. “ Nothing was more remarkable than the *esprit de corps*, the self-sacrifice, the readiness to take responsibility displayed by the services, and especially the security services—the Punjab Commission and Punjab Police—in the stern tests to which they were subjected under the double strain of War and internal troubles. One-fourth of the British Officers of the Commission and Police, and one-third of those in other departments, had been taken away for active service or duties connected with the War. Those that remained bore the strain of extra work and responsibility with cheerful readiness. Throughout the War, and after, there was not even the shadow of a claim for the War bonuses which were so liberally granted to Civil Servants at Home.”¹ The Government of India, were too concerned with meeting the demands of clamorous politicians to bestow much attention on their loyal servants. The latter suffered in silence and for many the increased burden of debt “ was the only thing they had to show for their self-sacrifice.”² Still less recognition was accorded to the fortitude shewn by Civil Servants as a whole in dealing with the rebellion of 1919 ; their efforts arousing the displeasure rather than the gratitude of the Government of India. The work done by Mr. Ellis, I.C.S., for example, “ in drafting

¹ O'Dwyer 233-4.

² O'Dwyer 234.



the martial law regulations, in preparing the various conspiracy cases for the Courts, and generally in advising the civil and military authorities in a novel and critical situation was beyond all praise. But it appears to have met with censure rather than with due recognition from higher authority".¹

It was therefore on a service already disheartened that the Reforms proposals burst like a bomb.

The Service
and the
Reforms.

As far as can be seen, even Mr. Montagu recognised the necessity of compensating officials for the loss of power and prestige by additional pelf. But the Government of India was willing to go to any lengths, in its futile endeavour to placate the Indian politicians, and the generous intentions of Mr. Montagu (if they existed) were not translated into action. The pleading Civilians were answered in a modern equivalent of the words of Rehoboam. "Whereas my father did lade you with a heavy-yoke, I will add to your yoke; my father hath chastised you with whips, but I will chastise you with scorpions." The childrer of Israel soon found a short way of dealing with Rehoboam, but the unfortunate Civilians had to endure the scorpions of the Government of India. Their very loyalty was their ruin. Trained to look for protection to the very Government which was now chastising them they had no organisation round which opposition might crystallise. Some of the wilder spirits did indeed suggest universal malingering or the meticulous observance of all Government and legal rules, a step which would have soon brought administration to a standstill. But such schemes demanded universal acceptance, an impossible condition, in view of the influence of loyal traditions on the more conservative who had failed to appreciate the changed conditions, and the blackleg tendencies of self-seeking opportunists, who looked to gain reputation and fortune out of the general misery. For some time the effect of high post-War prices was mitigated² by the high sterling value of the rupee. But by the end of 1920 the rupee fell to its pre-War sterling value, while prices

¹ O'Dwyer 235.

² In appearance only: this high value of the rupee was mainly due to the temporary depreciation of the sovereign.



in India remained high and grew higher with tariffs imposed by the new Indian Legislative Assembly.

All the services suffered ; but the Indian Civil Service were reserved for special chastisement. In the past they had rendered themselves unpopular with other services by their overbearing manner, and the just hatred of the tactics of those in the Government of India was unjustly visited on the Service as a whole. Moreover its political sagacity made it particularly distasteful to Indian politicians, whose wiles merely wearied, but did not deceive those experienced administrators. The opportunity was therefore taken of gradually withdrawing from the Service all those activities which were both interesting in themselves and earned popularity with the people. Agriculture, Industries, Municipalities, rural and urban development as a whole were entrusted to local bodies or experts and the Indian Civilian was left with the thankless tasks of imprisoning, whipping and shooting. His feeble protests were met with the trite remark that he should no longer consider himself as a ruler, but as a missionary of Empire. The reply was plausible but fallacious. The missionary gladly gives himself to be cooked and eaten ; but he would less blithely enter the cannibal kitchen had he just received a communication from the Society for the Propagation of the Gospel censuring him and reducing his pay on account of his oppressive treatment of the natives. And the Civil Servant might have willingly abandoned the *cursus honorum*, redolent of Odours of the Bad Egg, and Kiss-me-behinds,¹ had his degradation not deprived him of all opportunities of doing useful work.

But the fallacy of its reasoning did not worry a Government which knew that its servants were helpless. For helpless they were. At a time of high prices even the proportionate pensions then offered enabled very few to retire ; and it was some time before the cessation of recruitment in England brought the situation to the notice of the British Government. Meanwhile the majority carried on, giving Government no

¹ Derisive nicknames bestowed on the Order of the British Empire and the Kaisar-i-Hind Medal by those who despised (or affected to despise) those honours.

longer the willing service that had been so gladly rendered to Sir Michael O'Dwyer, but a listless apathetic routine performance of such duties as were absolutely unavoidable. Their main interest had shifted from India to England, where they were willing to take any appointment, however poor, which would get them out of India. Such a discontented service was no longer willing to take risks or responsibilities in the restoration of law and order, and their attitude had much to do with the approaching administrative breakdown.

In England, however, the wails of the services were interpreted not as the cries of hopeless despair but as the angry yells of wild beasts baulked of their prey. Skilful propaganda had impressed the British public with the unsympathetic nature of their compatriots in India.¹ In the Punjab indeed the boisterous affability punctuated by occasional reprimands which characterised the Deputy Commissioners in their dealings with the rural classes, won them both respect and affection. But the frigid politeness, with which members of the Secretariat greeted visitors of whatever colour, did perhaps more to alienate educated Indians than the more notorious escapades of hot-headed subalterns or graceless commercial travellers. Even before the Reforms Scheme, however, it was recognised that the casual indifference which characterised Englishmen in their dealings with each other tended to exasperate the sensitive Indians of the towns;² and the increasing Indianization which followed on the Reforms Scheme imparted a desirable polish to the manners of Englishmen in their dealings with Indians. At heart, however, they probably liked them less. Normal equality gave the Indian official every advantage over his white brother. Living in his own land, he could always pull political strings to get

¹ *E.g.*, Bishop Gore in his otherwise admirable "Belief in God" (John Murray 1926) stated that the "attitude of Britons in India, whether Government officials or traders, towards the natives and their religions remained very far below what was to be desired in the way of sympathy."

² In this respect the Indian peasantry are much more akin to the English than their urban brethren.



himself out of difficulties. His holidays could be spent cheaply with relations, whom he could always repay officially. He need not be separated from his wife, nor send his family to England for education. Thus a pay which barely sufficed for the needs of an Englishman maintained an Indian in luxury, and the meagre Overseas Pay subsequently granted to Englishmen did little to restore the balance. Serving in their own country, moreover, Indians had no inclination to retire early, and this combined with the increasingly early retirements of Englishmen, foreshadowed a time when the higher posts would be monopolised by Indians. Humbly pedalling to office on his bicycle, the English official of the Reforms era would be smothered in the dust of the gorgeous car of his Indian confrère. Arriving, he would read with a somewhat jaundiced eye the latest order from the Governor in Council inculcating increased sympathy towards Indians.

The resulting discontent was accentuated as the relative inefficiency of Indians in higher posts became increasingly evident. Prior to the Reforms the Indians selected for such posts were picked men, on their best behaviour, and their work contrasted not unfavourably with that of the more lazy Civilians. With the Reforms however the position was more than reversed. Englishmen might be no longer willing to shoulder responsibility, but they could not afford to be lazy; while Indians under a Governor, who above all feared the accusation of racial partiality, relaxed the standards hitherto maintained in the higher posts, to which they were now freely admitted. It was more their misfortune than their fault that they were frequently partial, and that even when they were impartial they were not generally believed to be so. A more serious defect was the dilatory procrastination which postponed inconvenient decisions, and thus accentuated the defects of a bureaucratic regime. The old administrative system had endowed these higher posts with excessive powers on the understanding that they would be used to exercise a

strict control over the subordinate staff. With the Indianisation of the higher posts this control was greatly relaxed, and responsibility might well have been devolved on the subordinate Indian staff, often consisting of men of ability and experience, who chafed under the petty restrictions imposed by those whom they regarded as upstarts.

Thus the new political system was accompanied by a decline in administrative efficiency. The Reforms and administration. At the moment at which the Reforms were introduced, the Punjab stood out as an area in which administrative considerations must have appeared to the great mass of the inhabitants to outweigh those connected with political developments. This was not entirely the result of political apathy. The memory of the reign of general anarchy which followed the breakdown of the Sikh Monarchy was still recent : there were many areas in which the tradition of lawlessness and violent crime was a persistent fact. The administration, not yet freed entirely from these problems, had for many years also been preoccupied with questions arising from the assessment of land revenue, so vital to the contentment of a community of small peasant proprietors inhabiting an area subject to uncertain or unfavourable climatic conditions. During the two decades preceding the Reforms a new problem and fresh interest had been added in the development of those great schemes of irrigation which had gone far to transform the physical aspect of the Province. Their effect was not limited to external changes, nor to the amelioration of the material conditions of the people. Great as those were, far reaching as was their effect in securing the Province from the recurrence of those periods of scarcity which were so insistent a feature of the history of previous centuries, their psychological effect was equally marked. There was a general elevation of the standard of living, a quickening of consciousness among the agricultural classes, an enquiry among the trading classes for new outlets for the investment of their realized resources.¹

¹ P.A.R. (1923-4) 7.

This then was the situation to which the Reforms Scheme had to adapt itself. The rapid material development of the Province had concentrated attention largely on executive measures and on the capacity of the administration for initiating new projects of improvement. But these developments had a political reaction. The sentiments of distrust entertained by agriculturists generally against the monied and urban interests, long inchoate and lacking in organized expression, had gained direction by the passing of the Land Alienation Act.¹ As the material security of the agriculturists increased and their class-consciousness was quickened, that Act became at once a rallying point and a fixed article of faith with them. Even before the days of the Reforms Scheme, therefore, the division between the urban and rural classes possessed both force and reality. This division, resting on a basis mainly economic, was supplemented by other distinctions, which appealed even more to emotional idealism. The recent changes in the condition of life intensified thought on religious lines. First the Muhammadans of the Punjab, and later the Sikhs, awoke to their claims as communities, and a more forcible assertion of their position. At the end of the Nineteenth Century, the Provincial Government had been obliged to take cognizance of the unimportant part borne by Muhammadans in a Province in which they were numerically preponderant. To that extent, it had already anticipated the articulate opinion of that community; but as time passed, these feelings achieved full expression, and passed from the administrative to the political sphere. Such political organization as the Punjab possessed, and its chief organs in journalism, were mainly in the hands of the Hindu minority; but even before the Reforms Scheme, the Muhammadan majority had begun to invade their sphere of influence. Thus before they attained the power which the new franchise gave them, it was clear that the Punjab Muhammadans were not content to accept Hindu leadership in politics, and

¹ p. 25.

would insist on a fuller recognition of their claims in every sphere.¹

Such then was the situation at the inception of the Reforms :—an executive absorbed by pressing administrative problems vital to the development and progress of the Province ; a population of which the mass was for the moment more interested in the solution of these problems than in political development, but with a growing tendency to open cleavage on communal or occupational lines. It is possible that some portion of the Hindu political element welcomed the Reforms Scheme as likely to afford them an opportunity of confirming a position gained by superior education and capacity in the use of political methods, before the other communities could advance to a position in politics commensurate with their numbers and their stake in the life of the Province. It is doubtful if at that time either the Muhammadans at large or the agricultural community were entirely aware of the opportunity which the ballot box would give them for developing their own interests. Certainly the authors of the scheme cannot have foreseen the speed with which its working would influence the relations of the two communities and would give point to the antagonism between the urban and the rural interests. The general disturbance of the political atmosphere following on the non-co-operation movement affected the Punjab, even though the main storm centre was without : the intensifying of communal feeling was not allayed by the course of the *Shuddhi*² and *Sangathan* campaign in the United Provinces ; and the financial stringency which followed the attempt to meet economic conditions consequent on the War, while it restricted the opportunities of Ministers, had an even more serious effect on the general attitude of the Council towards Government measures.³

¹ P.A.R. (1923-24) 8, 9.

² The *Shuddhi* movement was one to convert Muhammadans to Hinduism (i.e., make them Shudh or pure).

³ P.A.R. (1923-24) 10, 11.

The Reforms Scheme left most of the Deputy Commissioner's powers intact, and it was the spirit of the Hunter Commission rather than that of the Reforms Scheme that made Deputy Commissioners disinclined to exercise them.

Executive Officers who had continually to come to rapid decisions on a succession of multifarious details could only avoid making the "errors of judgment," so condemned by that Commission, by avoiding responsibility whenever possible, and when that could not be done, acting as inertly as circumstances permitted. "Safety first" was inevitably their motto, and the resulting decline in efficiency was particularly manifest in the passivity of the governmental machine before the onslaughts of the Akalis¹ and the non-co-operators. District administration moved in a vicious circle. The decline in efficiency destroyed confidence in the administration and gave point to the arguments of the politicians; while the resultant absorption of the Deputy Commissioners in politics still further diverted their attention from the essentials of administration. They had no longer time for the systematic touring, which had formerly kept them in touch with the people of their district, and they tended more and more to rely on the garbled reports of the Police or of the interested visitors,² whose numbers increased now that it was impossible to check their statements. Land revenue work particularly suffered from the distractions of Deputy Commissioners, their subordinates ceasing to take interest in work, which was both tiresome and difficult, now that they were no longer encouraged or controlled from above.³

The increased number of Indians employed as Deputy Commissioners was due not only to the greater Indian recruitment for the Indian Civil Service, but also to the greater opportunities of promotion open to the provincial

¹ p. 130.
² *Mulaqati*. It was (and is) the duty of Deputy Commissioners to hear the complaints or tales of all those who wished to visit them—a herculean task.

³ P.A.R. (22-3) 37.

Service, whose name was now changed to Punjab Civil Service. Munsifs¹ (who now received the more dignified name of Subordinate Judges) were included in it. The executive and judicial branches were entirely separated. The entire judicial branch was now directly recruited, as was 50 per cent. of the executive, the remaining 50 per cent. of the executive being promoted from the subordinate services. A time scale for pay was also determined, the number of superior posts open to the Punjab Civil Service being also increased. In 1922 they consisted of six appointments of District and Sessions Judge, four appointments of Deputy Commissioners and one appointment of Under-Secretary to Government. The initial pay of an officer of the Punjab Civil Service holding a superior appointment (*i.e.*, that of Deputy Commissioner or District Judge) was fixed at Rs. 300 above his ordinary time scale pay, after which he would get promotion according to the Indian Civil Service time scale. Such officers were made eligible, with members of the Indian Civil Service, on their merits for all posts in the Civil Service cadre.² The prevailing laxity spread from the executive to the judicial, and the proceedings of one case which had been ordered to be heard *in camera* were reported in full in some organs of the extremist press, shorthand notes being made by the pleaders present.

The essence of the Reforms Scheme lay in the establishment of effective provincial autonomy and the introduction of responsible government in the provinces. The Provincial Government was now collective in form, under a Governor in Council. At the head of the Executive was the Governor with an Executive Council of two Members appointed by His Majesty. The picture of the Governor enthroned with his Councillors around him was calculated to impress the imagination of those who did not know that most of the orders purporting to issue from this august tribunal really emanated from some member of the Secretariat. Associated with

¹ The old Mogul name for judges (from Arabic *insaf*, justice).

² P. A. R., 77.

³ O'Dwyer 336.

the Executive Council as part of the Government were two¹ Ministers chosen by the Governor and holding office during his pleasure ; though no Minister could hold office for longer than six months unless he was or subsequently became a member of the Legislative Council.² Thus the functions of the Provincial Government were divided into two parts, those made over to so-called popular control and those which for the time being remained in official hands. These functions were called 'transferred' and 'reserved' respectively, and were dealt with respectively by the Governor and his Ministers, and the Governor and Council.³ The Reforms effected no great changes in the Secretariat itself. The abolition of the Revenue Secretary owing to financial stringency had little effect except to exasperate those among whom his work was distributed. The Financial Commissioners, who had previously constituted a distinct *imperium in imperio* were now reduced to the position of Secretaries to the new Members and Ministers, a change which not only diminished their prestige but also rendered impossible that supervision over the details of administration which constant touring had previously enabled them to exercise. There was no striking change in the actual administration of the Transferred Departments. The executives of these services for the most part continued as in pre-Reforms days. But there was in some of the Transferred Departments a definite quickening of the administration and a concentration of public attention which made for greater vitality. The ambitions of Ministers were curtailed by the financial difficulties of the Province, but their departments were, on the whole, treated with somewhat greater liberality than they would have experienced under a pre-Reforms Government.⁴

Written constitutions have a tendency to develop on lines which their framers never anticipated. The practical working of American Dyarchy to Presidential elections is on lines quite different
 Tendency of Dyarchy to disappear.

¹ Raised to three in 1927.

² P.A.R. 64.

³ P.A.R. 63.

⁴ P.A.R. (1923-4) 15.

from those intended by George Washington. Similarly, in the Punjab administration, the distinction between reserved and transferred subjects soon shewed a tendency to disappear. Many questions affected both reserved and transferred departments, and in practice it was often found difficult to discriminate. In the allocation of funds the distinction between reserved and transferred subjects was treated as one between the so-called beneficent¹ departments of Government (e.g., Education, Medicine, Public Health, Agriculture and Industries) which were under the control of the Governor acting with his Ministers and those which were either revenue-producing or dealt with the administrative machinery of government, which were under the Governor in Council. Funds indeed were short. But their allocation was easy till the Budget of 1923-24, when money was very scarce. After several conferences, however, the two halves of the Government came to an agreement amongst themselves. A substantial reduction was made in the expenditure of all departments, the allotment between the Ministers themselves of the grants for the transferred departments being effected by mutual accommodation.²

7. FINANCIAL PROBLEMS.

It is a very good world to live in,

To lend, or to spend or to give in,

But to beg or to borrow, or to get a man's own

It is the very worst world that ever was known.

EARL OF ROCHESTER.

The importance of the financial side of administration is often apt to be overlooked. Finance is indeed but a means to an end—good government. But it is a most essential means : and no government has been able to perform its other functions efficiently when its financial machinery has

¹ The implication that this beneficence did not characterise the important administrative departments of Land Revenue, Land Records and Registration, which touched the vital interests of the agricultural population in a thousand ways, led to these departments being starved in funds and neglected in practice.

² P.A.R. (1923-4) 1.



got out of gear. The beams of glory which ushered in the Reforms were soon darkened by the murky clouds of financial difficulties. The post-War boom in prices more than doubled the cost of the administration for a government whose main source of income, Land Revenue, was stationary over long periods of time. Cynics indeed went so far as to declare that the Reforms were designed to shift the burden of the unpopularity of the inevitable increased taxation from the Government of India to the new democratic Provincial Councils. Be that as it may, it was unfortunate that the Finance Member¹ of the Punjab, inexperienced as he was in financial matters, should be subjected to the control of a still more inexperienced Council, at a time when it was necessary to abandon the traditional methods which had sufficed in the past.

In early days the British inherited from their predecessors the land revenue as the main source of income. The terms Financial Commissioner and Revenue Officer, which now denote officials whose main duty is land administration, still recall the time when revenue connoted land revenue, and finance land administration. Over this provincial finance a detailed control was exercised by the Government of India. The commercial principles which underlay the East India Company's rule sufficiently explain the original decision that the Central Government should keep full control of all revenues in their own hands; and, though a complete re-organisation of the finance of the country followed soon after the transfer of India to the Crown, the system of centralisation was retained. Provincial Governments had in other respects extensive powers, but they could incur no actual expenditure without the formal orders of the Government of India.² That "Government, saturated with traditions of cheese-sparing economy, was exceptionally liable to unreasonable financial panic, and was usually disposed to be severely utilitarian, grudging every rupee not devoted to the ordinary purposes of commonplace administration."³ The

¹ The two Councillors of the Governor were denominated the Finance and Revenue Members respectively.

² *L.F.R.* 230-1.

³ *Smith India* 776.

distribution of the public income degenerated into something like a scramble, in which the most violent had the advantage, with very little attention to reason. As local economy brought no local advantage, the stimulus to avoid waste was reduced to a minimum, and as no local growth of the income brought any local advantage, the interest in developing the public revenue was also reduced to the lowest level.¹

Lord Mayo's Government² has the credit of the first attempt to make the provincial Governments responsible for the management of their own local finances. Each provincial Government was given a fixed grant for the upkeep of definite services, with power, subject to certain conditions, to allocate it as seemed best, and also to provide for additional expenditure by the exercise of economy and if necessary by raising local taxes. All the residuary revenues the Government of India retained for its own needs. Experience of this initial step justified a further advance, and under Lord Lytton³ the control of the expenditure upon all ordinary provincial services was delegated to provincial Governments, which in place of the fixed grants previously given them now received the whole or part of specified heads of revenue wherewith to meet such charges. But the difficulty of exactly adjusting means to needs remained, and as the revenue from the transferred heads was not ordinarily sufficient for provincial requirements, it was supplemented by a percentage of the important head of land revenue, which otherwise remained an all-India receipt. Settlements on these lines were made with the provinces for five years in 1882, and were revised in 1887, 1892 and 1897, not without controversy and some provincial discontent. The Punjab, for example, throughout its financial history bore traces of the makeshift character of its origin. A non-regulation⁴ province, the appendage of an appendage of the Bengal Presidency, it was from the first given only sufficient to carry on. The older provinces were firmly entrenched in rights from which it was difficult to displace

¹ L.F.R. 230-1.

³ 1876-80.

² 1869-72.

⁴ See L.F.R. 193-4.



them ; the wealthy province of Bengal, in particular, which was particularly lightly taxed, received nevertheless a disproportionately large share of the loaves and fishes at the disposal of a Government of India whose headquarters were at Calcutta ; and the miserly policy followed with regard to buildings and roads in the Punjab was largely due to the lack of sufficient funds for development. Taxation was then levied almost entirely on the rural population. Practically the whole Punjab revenue from the largest head (land revenue) to the smallest (stamps), was drawn from the producing masses, whilst the literate and commercial classes, who under British rule benefitted at the expense of those masses, escaped taxation almost entirely.¹

In the year 1904 the introduction of the system of quasi-permanent settlements marked a further devolution. new departure. Thence forward the revenues assigned to a province were definitely fixed, and were not subject to alteration by the Government of India save in the case of extreme and general necessity, or unless experience proved that the assignment made was disproportionate to normal provincial needs. The object was to give provincial Governments a more independent position and a more substantial and enduring interest in the management of their resources than had previously been possible. Under the old system it happened every now and then that the Supreme Government were forced by financial stress to resume balances standing to the credit of the provinces when the settlement expired. This killed any motive for economy, as provincial Governments knew that if they economized in one direction in order to accumulate money for other needs their savings were imperilled, while their reduced standard of expenditure would certainly be taken as the basis for the next settlement. Improved financial conditions and a more liberal outlook combined to remove these difficulties. Provincial Governments could now count on continuity of financial policy, and were able to reap the benefit of their own economies without being hurried

¹ L.F.R. 231-3.

into ill-considered proposals in order to raise their apparent standard of expenditure. But the Government of India was also a gainer. Its relations with the provincial Governments were smoothed by the cessation of the recurring quinquennial controversies, and it was also left in a better position to calculate its own resources. A little later on the provinces gained still further. Hitherto, the liability for famine relief expenditure had lain upon them, and the Government of India stepped in only when their resources were exhausted. There was devised instead a new famine insurance scheme, by which the Government of India placed a fixed amount to the credit of each province exposed to famine, on which it could draw in case of famine without trenching on its normal resources. When this fund was exhausted further expenditure would be shared equally by the central and provincial Governments, and in the last resort the Government of India would give the province further assistance from its own revenues. In 1917 this arrangement was simplified by making famine relief expenditure a divided head, the outlay being borne by the central and provincial Governments in the proportion of three to one, which coincided approximately with the actual incidence under the previous system.¹

The Punjab however was still at a disadvantage. The resources of the Province had been greatly depleted by the formation of new districts and by the demands of colony administration, of police reorganisation, of agriculture and of education, and it became necessary to institute a period of retrenchment and to insist on punctual realization of the land revenue demand, in the collection of which the previous years of scarcity had encouraged some laxity. More efficient control of the provincial finances resulted from the appointment of a Financial Secretary to Government, which, with the addition of a second Financial Commissioner, became possible on the reduction in 1910 of the appointments of the Settlement and Excise Commissioners. In 1911 modifica-

¹ P.A.R. 117-8.

tions were introduced in the provincial settlement abolishing many of the fixed assignments granted by the Government of India since the last settlement to cover the cost of administrative changes subsequently ordered. In their place an increased proportion of certain shared heads of revenue was allotted to the Province. Three years of argument were necessary to effect this change, and establish the principle that these expanding charges could not fairly be met by a fixed income. Some illiberality in the original settlement itself was also recognised and removed. In 1912 the settlements were made permanent, the provincial position being further improved by reducing the fixed assignments and increasing the provincial share of growing revenues, the Government of India at the same time curtailing its intervention in the preparation of the provincial budget.¹

But the Punjab started her administration with a financial handicap from which she never completely recovered. Clamour extorted piecemeal concessions from the Government of India, but the financial situation was never reviewed as a whole till the Reforms Scheme came into force. The opening up of the Canal Colonies placed the Punjab somewhat in the position of a new colony relative to the older and more thickly populated provinces. But while the development of Canada or Australia was stimulated by large loans from the English money-market, the Punjab got no advances for development, except the actual loans advanced for railway, and canals. Moreover judged by European (or even Japanese) standards, Indian Taxation was insufficient to bear the cost of administration of a country which was beginning to demand the amenities of an advanced civilisation.² The Kasur and Sirsa sub-divisions, which should have been raised to the status of districts if they were to be effectively administered, still maintained their makeshift arrangements. In the zeal for economy even tahsils were reduced in number often, as in the case of the elimination of the Sampla tahsil

¹ P.A.R. 119-20.

² Cf. Jack, 121-127, who shews that the pre-War taxation in Japan was nine times that in Bengal.

of the Rohtak District, to the great inconvenience of the district administration. Necessary roads could not be made and buildings were neither artistic nor convenient. Under these conditions the financial policy of the Punjab, subjected as it was to the strict control of the Government of India, bore throughout the hand to mouth characteristics of its inception. Long views were impossible. These difficulties were aggravated during the War, when a parsimonious policy was both necessary and justifiable. But as a result the Reforms Scheme found the Punjab with schemes of administrative and economic improvement long overdue. It gave the Punjab financial freedom : but the pecuniary advantages obtained were exhausted in the cost of an expensive democratic machinery, and a heavy increase in expenditure due to the rise in prices, combined with an inelastic revenue. As previously, therefore, the Province had perforce to satisfy immediate financial necessities rather than aim at the permanent economic benefit of the Province.¹

The centralised system of finance passed away as a result of the changes introduced by the Reforms, whose authors had urged the necessity of complete separation between the finances of the central and provincial Governments. Their main recommendations were that no head of revenue should continue to be divided, and that Land Revenue, Irrigation, Excise, and Stamps should be completely provincialised, leaving Income-tax only for the Government of India. In order to give the provinces a slight interest in the collection of this tax also they were entitled to 3 pies on each rupee of the increase in the assessable income over and above the income taxed in 1920-21. The amount so obtained however was trifling, only Rs. 2½ lakhs being budgetted under this head in the Punjab in 1922-3. Responsibility for famine insurance was also thrown on the provinces. The Punjab, however, being well protected by its great irrigation works was only subjected to an annual charge of Rs. 3½

¹ P.A.R. 124-5.

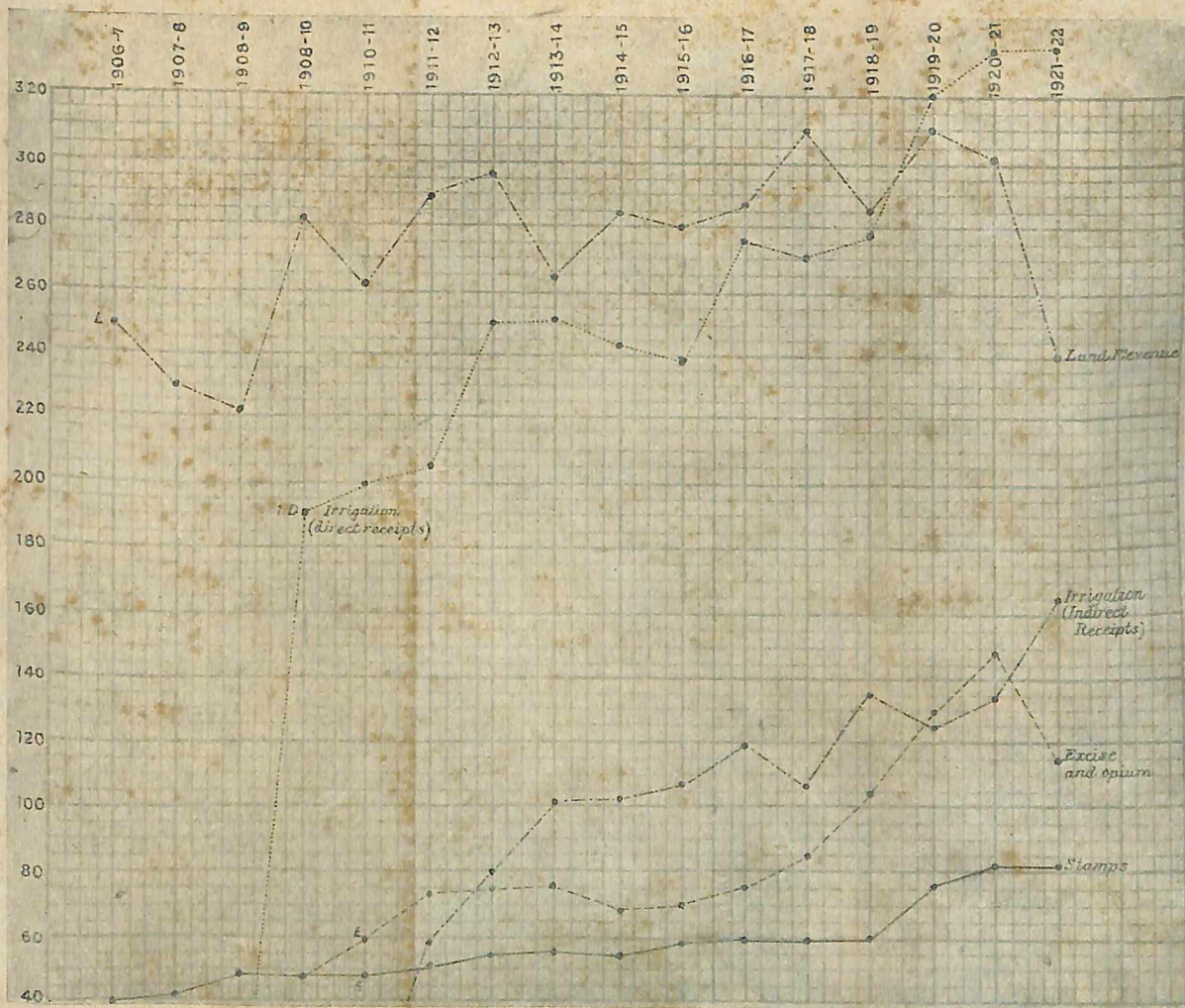


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PUNJAB GOVERNMENT.

MAIN HEADS OF REVENUE OF 1906-07 TO 1921-22.

- NOTE.—1. Land revenue oscillates violently about a stationary quantity. It does not increase with agricultural wealth of province and the diminished purchasing power of the rupee.
2. Large and continuous growth of irrigation receipts, irrigation indirect receipts are made up of the portion of land revenue due to irrigation *less* additional cost of administration.
3. Continuous increase of Excise receipts till temperance policy of 1920-21.
4. Stamp receipts were stationary. They did not increase in proportion to wealth of province and diminished purchasing power of rupee.



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Fig. 4.

Diagram I

lakhs as against the Rs. 63½ lakhs due from Bombay. Finally, the provinces were given complete freedom to draw on their balances—the accumulated savings of ten years. In the Punjab however this balance was recklessly squandered, being converted into a deficit of Rs. 90 lakhs in only one year.¹ Under this arrangement, however, the Government of India would lose heavily. It was therefore necessary to get contributions from the provinces; and here the difficulties began. After interminable discussions it was arranged that the ultimate contributions from the provinces should be roughly in proportion to their wealth, and so while Bengal paid 19 per cent. of the total provincial contributions the Punjab was only liable for 9 per cent. But in view of the difficulty to a Province like Bengal, of immediately adjusting her finances, this scale was only made an ultimate goal, the immediate charges being proportioned to the estimated relative burdens under the old system. Thus while the Punjab was charged Rs. 175 lakhs, Bengal was only assessed at Rs. 69 lakhs and as a concession to Bengal clamour even this sum was remitted for three years.²

These contributions were felt by the provinces to be a burden, and feeling on the subject did not tend to diminish. Military expenditure, which was the chief Imperial charge, shewed no signs of expansion, while the provinces required continually increasing funds for the development of Education, Communications, Public Health, Agriculture and other beneficent activities. *Per contra* two Imperial Receipts under Customs and Income-Tax were capable of indefinite expansion, while Provincial Receipts such as Land Revenue and Excise (under the temperance policy then in the ascendant) were inelastic. Thus the Government of India had an expanding revenue with a stationary expenditure and the Provinces the opposite. Schemes of development, paid for by the provinces, would mainly benefit the income of the Government of

¹ P.A.R. 12. For Indian monetary values see Appendix IV.

² P.A.R. (22-3) 77.

India. But, whatever might be its effect on provinces containing large commercial centres, a predominantly agricultural province such as the Punjab was for the time being a gainer under the new system. Other things being equal the Punjab would have come under the new régime with a cash balance of Rs. 140 lakhs in hand and a net annual further gain of Rs. 59 lakhs. Actually, however, it ended the first financial year after the introduction of the Reforms (1921-22) with a deficit of Rs. 205 lakhs of which Rs. 140 lakhs were met from the balance and the remaining Rs. 65 lakhs from an advance from the Government of India. This parlous position may be briefly attributed to financial blindness facing an inelastic revenue combined with a heavy increase in expenditure due to the rise in prices.¹

A rough² idea of post-Reform finance may be obtained from the appended statement and from the diagrams illustrating certain heads of receipt and expenditure.

Punjab Government Receipts.
(Rupees, lakhs.)

	1921-22.	1922-23.	1923-24.	1924-25.
REVENUE RECEIPTS.				
Land revenue (excluding sales of Government lands)	2,20	2,99	2,99	2,94
Excise ..	1,16	1,03	1,04	1,19
Stamps ..	82	89	96	1,17
Forests ..	50	34	44	37
Irrigation (Working expenses deducted) ..	3,33	3,64	3,92	4,30
Education ..	7	9	9	11
Other beneficent departments ..	10	8	11	12
Other heads ..	59	68	66	66
Total ..	8,77	9,74	10,21	10,86
EXTRAORDINARY RECEIPTS				
Sales of Government lands	33	30	69	68
CAPITAL RECEIPTS.				
Famine Insurance Fund ..	..	4	4	3
Other receipts ..	14	42	22	22
Total Capital Receipts ..	47	76	95	93
Capital deficit ..	88	41	66	45
Total ..	1,35	1,17	1,61	1,38

¹ P.A.R. (22-3) 78-9.

² Very rough, I fear. Both the statement and the diagrams, are extracted from the Punjab Administration Reports, 1921-22 to 1924-25 which were written by me. They contain all the information I could get out of the Finance Department, which was wrapt in the mystery characteristic of experts, religious fanatics, and Government departments.



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PUNJAB GOVERNMENT. TOTAL REVENUE AND EXPENDITURE.

1. Opening balances are excluded.
2. Amounts for 1921-22 shew results under the old system of accounting.
- 3.—
 - (1) Before the war revenue and expenditure balanced roughly, both being small.
 - (2) During the war revenue exceeded expenditure.
 - (3) After the war expenditure exceeded revenue, both being large.
4. Figures for 1921-22 are given as they would have been under pre-Reforms system.

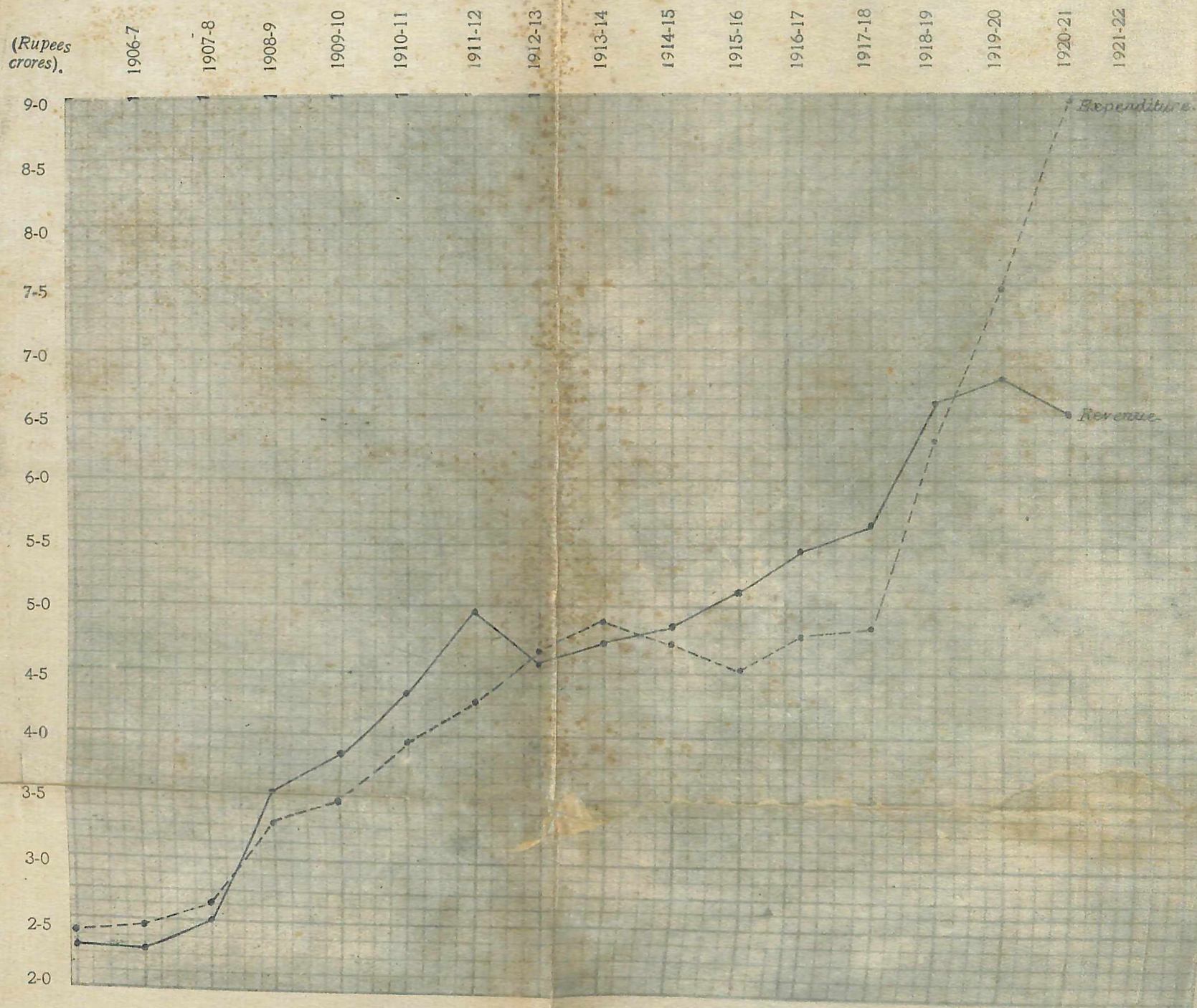


Diagram I, I



Punjab Government Expenditure.
(Rupees, lakhs.)

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	1921-22.			1922-23.			1923-24.			1924-25.		
	Ordinary.	Civil Works.	Total.	Ordinary.	Civil Works.	Total.	Ordinary.	Civil Works.	Total.	Ordinary.	Civil Works.	Total.
EXPENDITURE CHARGED TO REVENUE.												
Contribution to Government of India ..	2,01	..	2,01	1,75	..	1,75	1,75	..	1,75	1,75	..	1,75
Forests ..	44	..	44	44	..	44	30	..	30	27	..	27
Irrigation (Interest on Debt) ..	75	..	{ 93	{ 78	..	{ 90	{ 85	..	{ 1,02	{ 91	..	{ 1,08
Irrigation (Miscellaneous Expenditure) ..	18	..	{ 93	{ 12	..	{ 90	{ 17	..	{ 1,02	{ 17	..	{ 1,08
Police ..	1,12	3	1,15	1,23	2	1,25	1,10	1	1,11	1,12	2	1,14
Education ..	88	10	98	1,00	14	1,14	1,03	4	1,07	1,09	9	1,18
Other Beneficent Departments ..	82	8	90	80	3	83	79	7	86	82	..	82
Communications ..	..	45	45	..	33	33	..	42	42	..	4	4
Other heads ..	3,37	59	3,96	3,38	54	3,92	2,95	31	3,26	3,44	15	3,59
Total Expenditure charged to Revenue ..	9,57	1,23	10,82	9,55	1,06	10,61	8,94	85	9,79	9,61	9	9,70
Surplus ..	..	..	-2,05	..	..	-87	..	..	42	..	..	1,16
Total ..	..	..	8,77	..	..	9,74	..	..	10,21	..	..	10,86
CAPITAL EXPENDITURE NOT CHARGED TO REVENUE.												
Irrigation ..	..	..	19	..	..	92	..	..	1,47	..	..	83
Other items ..	..	..	1,16	..	..	25	..	..	14	..	..	55
Total Capital Expenditure ..	..	..	1,35	..	..	1,17	..	..	1,61	..	..	1,38

FINANCIAL PROBLEMS

The financial changes made under the Reforms Scheme necessitated a revision of budget procedure. The Government of India Act ¹ required that the estimated expenditure and revenue of the Province should be laid in the form of a statement before the Council in each year, and that the proposals of the Provincial Government for the appropriation of revenues should be submitted yearly to the vote of the Council in the form of demands for grants. This statement was called the Budget and was presented to the Council every March. It was based on a main division of expenditure into Major heads, such as Education and Agriculture, which again were divided into minor heads, such as Primary Education and Co-operative Credit, which were themselves divided into primary units of appropriation such as Pay of Officers, Pay of Establishment, Travelling Allowance and Contingencies. All expenditure had to be brought under one of the eight sub-divisions made up of combining the three following alternatives voted or non-voted, reserved or transferred, and capital or revenue.

Non-voted expenditure was such as could not safely be left to the whims of a Legislative Council and was made up of contributions payable to the Government of India, interest and sinking fund insured on loans, expenditure of which the amount was prescribed by any law, and salaries of the Imperial Services and Judges of the High Court. These it was not in the power of the Council to withhold. From the Budget point of view reserved items of expenditure were distinguished as those which when struck off by the Council might be restored by the Governor.

95. The new year's expenditure could best be gauged by framing an accurate estimate of the expenditure to the end of the current year. This was greatly facilitated by the introduction of what was known as the Statement of Excesses and Surrenders. This statement explained the difference between the supply voted and that which the most recent

The Statement of Excesses and Surrenders.

¹ The Act embodying the Reforms Scheme.

experience shewed to be necessary. It also enabled an excess under any major head to be set off against savings elsewhere, in pursuance of the great principle that unanticipated expenditure should be met by savings in other directions. It afforded the most accurate means of foretelling expenditure, and on it was based the revised estimate of expenditure. It also enabled lapses to be carried over to the next year's Budget. In the past a great defect of the Budget system had been that the fear of losing grants irrevocably led to reckless spending in the last month of the year. It is questionable whether the business of running a fried fish shop, or dressing a lady, could be managed satisfactorily if the lady and the fishmonger had their cash boxes emptied on April Fools Day, and were allowed no money at all for the next two or three months. Yet a similar system still continued to throttle the far more complicated business of administering a province. April Fools Day,¹ when the financial year commenced, came at the beginning of the best building season, when the winter harvest was gathered in and the days were long and dry. But under the absurd Budget System prevailing this period could hardly ever be utilised for the construction of Public Works, old grants having lapsed and new ones not yet being sanctioned. It was now thought to be to the interest of officers to under-spend rather than to over-spend, as if lapses were reported in time (the last date being February 1st) they would be restored and could be spent at leisure the next year². In practice however departments found it more profitable to exhaust their grants³ rather than to rely on the doubtful benefits offered by this complicated procedure.

The most important new departure in Budget Procedure was the definite separation of capital receipts and expenditure from revenue receipts and expenditure. Previous to the Reforms the expenditure on canal construction and loans to

¹ 1st April.

² P.A.R. (22-3) 91-3.

³ Stamps, sofas, arm chairs, carpets and other amenities, all afforded ways of getting rid of unspent balances in minor offices. Big departments squandered their savings on a more lavish scale, on garden walls, female quarters, or private printing presses.



local bodies or agriculturists was, it is true, reckoned as capital expenditure. Loans for these purposes were advanced by the Government of India to the Province. But the receipts from sale-proceeds of waste lands and Government estates were previously credited to the head Land Revenue and the sale of town sites belonging to Government to the head Miscellaneous. These were now recognised to be of a capital nature and were set outside the revenue accounts under the title of Extraordinary Receipts, the Budget from being amended accordingly. They were almost entirely receipts on account of land in the Canal Colonies and from the sale-proceeds of town sites due to the creation of new towns in the colony areas. These receipts totalled no less than Rs. 1,70 lakhs in eight pre-Reform years, and thus enabled the Province to accumulate the balance of Rs. 1,40 lakhs with which the Reform period commenced. It was also recognised that expenditure on Forests, Industries and Civil Works, which is directly remunerative, is of a capital nature, and only the interest on such expenditure and not the total amount, should be debited to revenue expenditure under those heads. But the extension of this procedure to these latter departments was indefinitely postponed. The large capital expenditure of Rs. 1,16 lakhs in 1921-22 under the head Other Items was due to the necessity for making large advances to agriculturists for seed and other purposes in view of the previous succession of bad harvests. The increase in other Capital Receipts from Rs. 14 to 46 lakhs in 1922-23 and 22 lakhs in 1923-24 and 1924-25 marked the first two instalments of the repayment of these advances. The large expenditure in 1923-24 of Rs. 1,47 lakhs under Irrigation was mainly devoted to the new Sutlej Valley Project.¹

Capital expenditure of this type, so far from being a drain on the resources of the Province, was directly remunerative, Irrigation capital expenditure, for example after paying all interest and other charges brought a large net profit

¹ P.A.R. (23-4) 64.

to the revenues of the Province. But the deficits on revenue account were in quite another category.¹ The total deficit in the first two Reforms years amounted to Rs. 2,92 lakhs. This deficit was due not so much to the increased outlay on the large salaries and ambitious projects of Members and Ministers, as to the sudden growth of expenditure due to the post-War rise in prices. This was exaggerated by bad harvests, which reduced the receipts from land revenue in the first Reforms year, from a normal of Rs. 3 to Rs. 2½ crores, and by the temperance campaign which reduced excise receipts from Rs. 1½ to Rs. 1 crore. It was met by a contraction of expenditure to (and in some cases below) the lowest level consistent with efficient administration and after much delay by an increase in taxation, and in particular an increase in the canal water rates (*i.e.*, the charges made for irrigation water in the Canal Colonies).

Land Revenue was still the most continuously important head of provincial income. Land Revenue receipts. Owing to seasonal variations, it was subject to considerable fluctuations, but on the average it remained practically stationary. It should, however, be remembered that the portion of land revenue due to irrigation is shewn separately as Irrigation (indirect receipts). This consisted of the estimated extra land revenue resulting from canal irrigation after deducting the additional expenditure of administration. In a district like Lyallpur, which was developed from a sandy waste, it roughly coincided with the whole land revenue less the whole cost of administration. But even when allowance was made for this, land revenue receipts bore no correspondence to the increase of agricultural wealth (excluding irrigated tracts) and prices. The fluctuations in land revenue receipts were, moreover, a continual source of embarrassment in provincial accounts, which might easily have been eliminated by some form of insurance on the lines of famine insurance.²

¹ P.A.R. (1922-3) 83.

² P.A.R. 126.

WESTERN THEORIES AND EASTERN PRACTICE

The following statement shows clearly how much
Net profit of the Provincial Receipts owed to the Irrigation
Irrigation. Department :—

Irrigation Income and Expenditure.

	INCOME.			EXPENDITURE.			
	Direct.	In-direct.	Total.	Work- ing Expen- diture.	In- terest.	Total.	Net profit.
	Rs. Lakhs.	Rs. Lakhs.	Rs. Lakhs.	Rs. Lakhs.	Rs. Lakhs.	Rs. Lakhs.	Rs. Lakhs.
1914-15 ..	255	112	367	103	71	174	193
1915-16 ..	247	118	365	119	72	191	174
1916-17 ..	287	130	417	118	70	188	229
1917-18 ..	282	118	400	120	75	195	205
1918-19 ..	285	146	431	120	76	196	235
1919-20 ..	231	134	465	135	75	210	255
1920-21 ..	340	143	483	154	73	227	256
1921-22 ..	332	187	519	184	74	258	261
1922-23 ..	370	181	551	180	75	255	296
1923-24 ..	362	177	539	147	85	232	307

Direct receipts were composed of water rates levied directly on canal-irrigated land. Indirect receipts consisted of the estimated extra land revenue resulting from canal irrigation after deducting the additional expenditure of administration. It was collected by the Land Revenue authorities and transferred to the Irrigation Department by book-credit. After deducting working expenses and interest on the capital cost a large profit remained.¹ The profits realized from Irrigation give some indication of the advantages which accrued to an economically virgin country from the scientific development of its resources. This was absolute profit, after deducting the interest on

¹ P.A.R. (1923-4) 72.



PUNJAB GOVERNMENT IRRIGATION AND LAND REVENUE RECEIPTS.

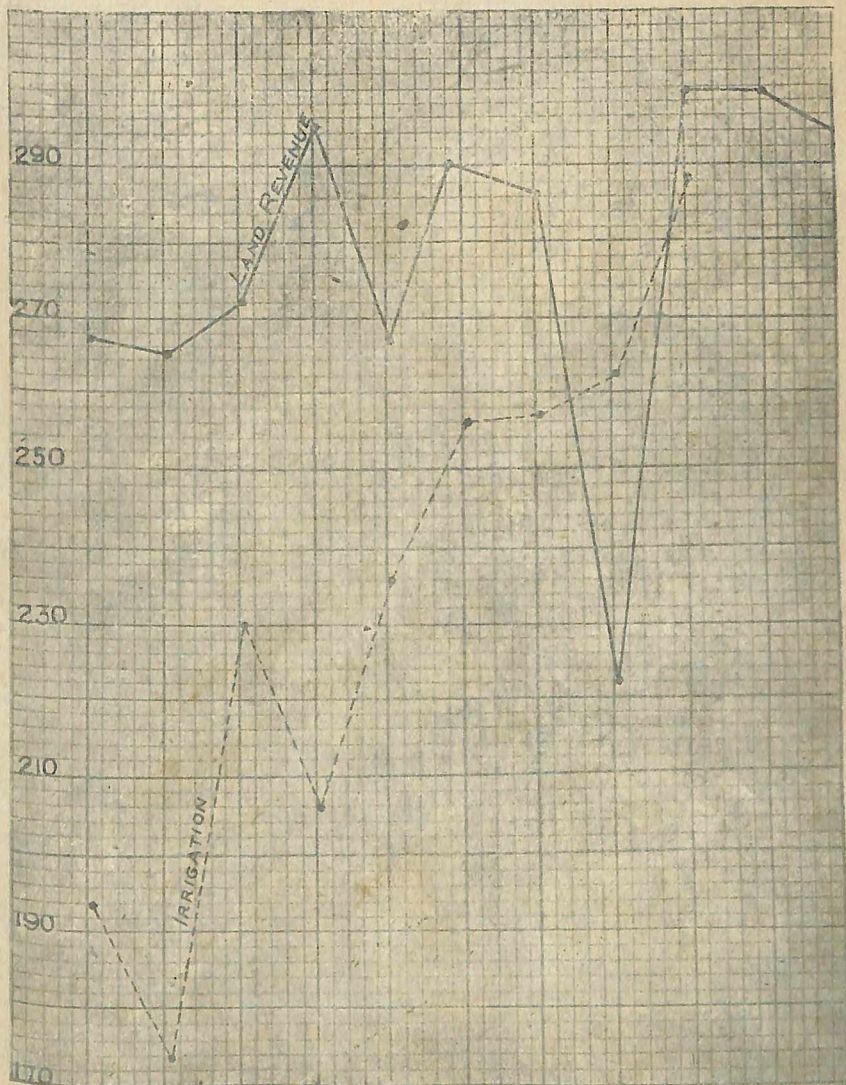
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Sales of land are excluded from land revenue receipts.

Land revenue, generally stationary, fell heavily in 1921-22 owing to bad harvests.

Irrigation receipts show a steady rise. These are net receipts after deduction of working expenses and interest.

1914-15	1915-16	1916-17	1917-18	1918-19	1919-20	1920-21	1921-22	1922-23	1923-24	1924-25
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PUNJAB GOVERNMENT EXCISE AND STAMP REVENUE.

NOTE 1.—The rapid rise in Excise revenue with the growing wealth of the province and the increased efficiency of the Excise Administration, and subsequent fall on the inauguration of a temperance policy under Reforms. The slight recovery in 1924-25 is due to the measures taken to prevent illicit distillation.

2.—The rise in stamp revenue is due to the increased rates introduced in 1922 which took effect slowly.

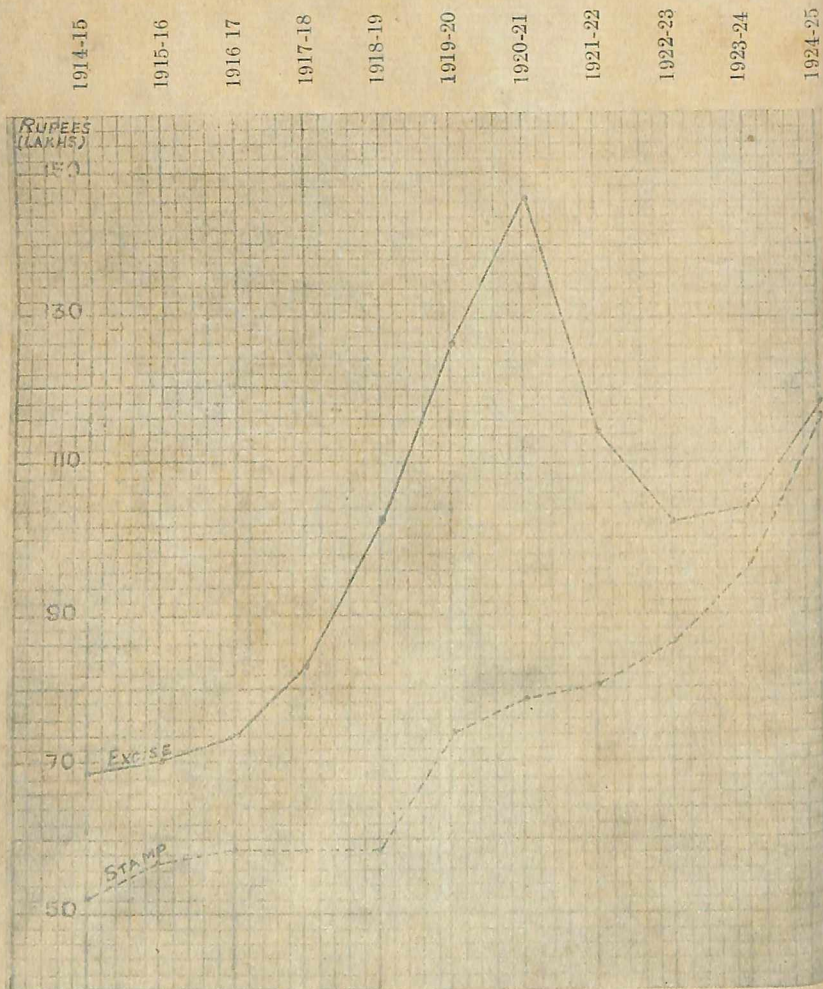


Diagram IV.

the loans raised. Put into another form the Lower Chenab Canal paid 45 per cent. on the Rs. 3½ crores invested in it, the Lower Jhelum Canal 19 per cent. on Rs. 1,7 crores, the Upper Bari Doab Canal 16 per cent. on Rs. 2½ crores and the Sirhind Canal 11½ per cent. on Rs. 2½ crores. It would be difficult to find such a profitable investment elsewhere. This of course leaves out of count the other revenue that Government derives from the Canal Colonies, all ultimately due to the Irrigation Department. And the direct receipts to Government were but a fraction of the total increase of wealth to the people of the Punjab. The Forest Department was only prevented from showing similar results by the necessity of meeting all capital expenditure from revenue.¹

The Stamp revenue was derived from two classes of stamps. Under the Court-fees Act, 1870, by which judicial stamps had to be placed on legal documents, a very inadequate tax was levied on litigation, the most flourishing and least profitable industry of the Province. By the Stamp Act, 1899, non-judicial or revenue stamps had to be affixed to documents such as bills of exchange share transfers, cheques and legal practitioners' licenses.² Two kinds of stamps, adhesive and impressed, were used to denote the payment of duty on documents. Impressed stamps were of two classes, namely, impressed sheets, the paper bearing the impression of stamps of varying values engraved thereon, and impressed labels which were affixed to instruments by Government officers employed to do so. Every Government treasury was a local depôt for the sale of stamps, judicial and non-judicial, to the public and of postage stamps to postmasters. Sub-treasuries were branch depôts for the same purpose. All treasurers were *ex-officio* vendors of stamped paper to the public. They were entrusted with stocks of stamps, and were required to meet the detailed demands for stamps made by the public, indenting upon the main stock of the local depôt when their

¹ P.A.R. 128.

² P.A.R. (1924-5) 103. Cheques were exempted from stamp duty in 1927.



own ran low.¹ In the year 1922 the duty on both classes of stamps was increased by between 30 to 50 per cent. of the previous amount, a step which marked the first essay of the Reforms Government in constructive finance. ↑

All the ordinary cost of administration was included in expenditure under the heads Land Revenue and General Administration, and Provincial Expenditure. Police. Prices had risen, and the pay of the higher Indian officials (Tahsildars were a notable exception) had risen more than proportionately, with a consequent rise in the cost of administration.² Education was a fetish, and even when financial stringency was at its worst, expenditure under this head rose perforce; but the expenditure on other beneficent departments³ remained stationary and that on communications actually declined. Though not directly remunerative, roads are necessary to agriculture and commerce and thus increase the wealth and taxable capacity of the people. In England a quarter of the £40 millions then spent annually on roads was raised by motor taxation. The Punjab with twice the area and more than half the population of England only spent one hundredth of this amount (Rs. 33 lakhs from the Provincial Government and Rs. 24 lakhs from local bodies). Most of this meagre allotment went on repairs, there was hardly any new construction.⁴ It was not till Sir Malcolm Hailey⁵ brought new life to all branches of the administration that the importance of communications to the development of the Province was adequately recognised.

By the financial arrangements made under the Reforms Scheme income-tax receipts, half of which previously went to the Province, were credited almost entirely to the Imperial Government.⁶

Income Tax before the Reforms.

¹ P.A.R. 130.

² P.A.R. (1922-23) 87.

³ P. 98.

⁴ P.A.R. (1922-23) 88.

⁵ Who became Governor in June 1924. See Appendix I.

⁶ P.A.R. (1924-25) 104. Whenever the assessed income of any year exceeded in the Punjab the assessed income of the year 1920-21, the Local Government was entitled to receive an amount calculated at the rate of three pies in each rupee of the amount of such excess. P. 104.



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PUNJAB GOVERNMENT

MAIN HEADS OF EXPENDITURE I.

- NOTE.—1. Slight decrease of expenditure during war and subsequent increase.
2. Civil Works expenditure is included in that of the Department (e.g., Medical and Sanitary) for which the works were executed.

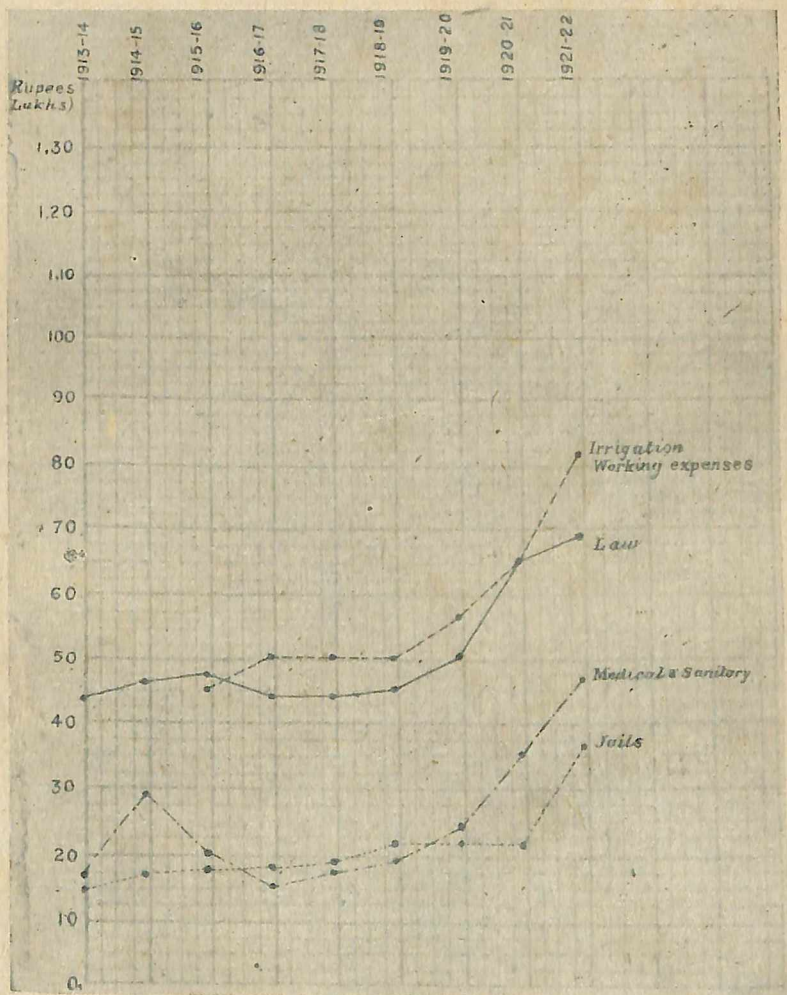


Diagram V.



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PUNJAB GOVERNMENT MAIN HEADS OF EXPENDITURE II.

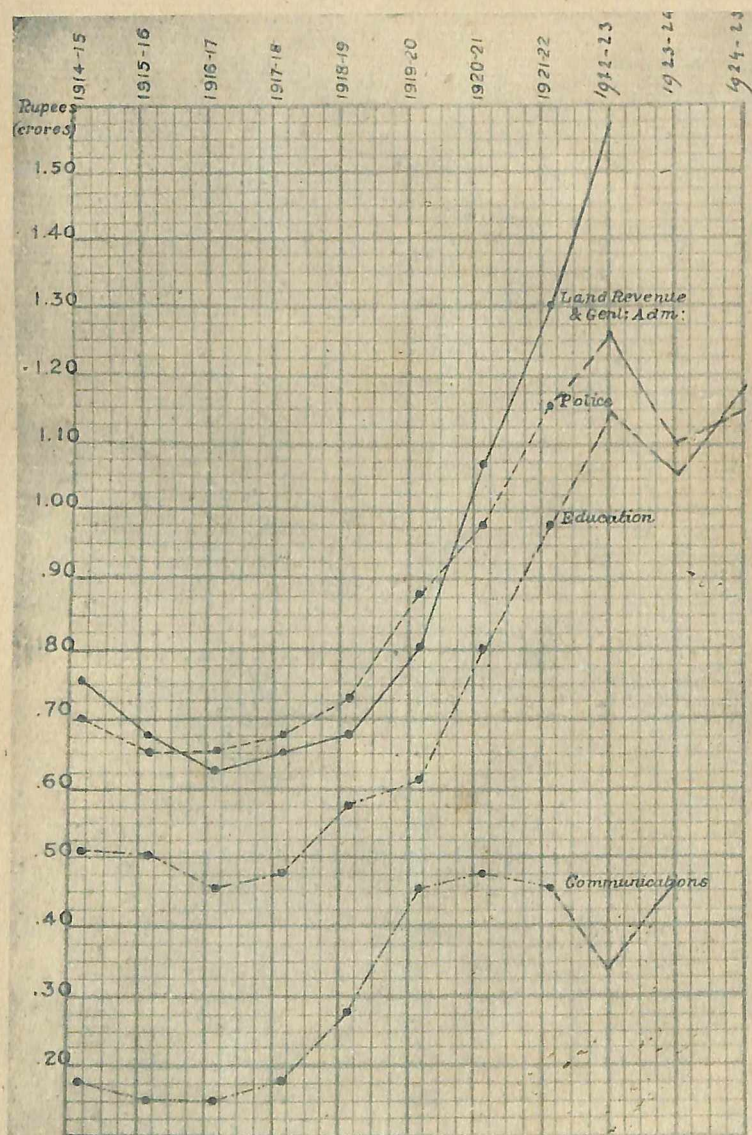


Diagram VI.

Civil Works expenditure (i.e., buildings, etc.) is included in that of the Department (e.g., Education) for which the works were executed, or under Communications.

NOTE—The slight fall in expenditure during the war, with the subsequent rapid rise : also the small and stationary expenditure on Communications.

Income-tax was first imposed in India in 1860, in order to meet the financial dislocation caused by the Mutiny. It was levied at the rate of four per cent. on all incomes of Rs. 500 per annum and upwards. Many changes were from time to time made in the system, and under the Act of 1886 the tax was imposed on all incomes derived from sources other than agriculture. On incomes of Rs. 2,000 and upwards the rate was five pies in the rupee, and on incomes between Rs. 500 and Rs. 2,000 four pies in the rupee. In March 1903 the minimum taxable income was raised from Rs. 500 to Rs. 1,000. In 1916-17 when taxation was generally increased to meet the deficit arising out of War conditions, the income-tax schedule was completely revised and graduated. After this, whenever they were in financial difficulties, the authorities were apt to turn to the income-tax as a means of raising fresh revenue. The last revision was in 1921-22 when the scale varied from five pies in the rupee on incomes between Rs. 2,000 and Rs. 5,000 to one anna and four pies per rupee on incomes of Rs. 40,000 or upwards. Income-tax receipts from the Punjab increased fourfold in the ten years preceding the Reforms, a far greater proportionate increase than that of any other source of income.¹ Originally the work of assessment was in the hands of Deputy Commissioners under the supervision of Commissioners. Assessments were made by the district land revenue staff, and in rural areas, the zaildars² were generally consulted. Later on special Income-tax officers were appointed who relieved Deputy Commissioners of much of this work.³ The resultant loss of control by Tahsildars and Deputy Commissioners over the money-lending and shop-keeping classes did much to facilitate the breakdown of authority which characterised the early Reforms period.

The new Income-tax Department came into being on the 1st September 1921. From the start it was charged with the assessment of the whole Province and on the 1st April 1922 it passed from the control of the Local Government to

The new
Imperial
Income-Tax
Department.

¹ P.A.R. 167.

² p. 69.

³ P.A.R. 166.

that of the Imperial Inland Board of Revenue, thereafter known as the Central Board of Revenue. The department proved a precocious infant and in its early years performed its duties so much more accurately and intelligently than its elderly preoccupied uncle, the District Revenue Administration whom it succeeded, that it was apt to think that it had already learned all that there was to be learned. It needed, therefore, the periodical visits of the fairy god-mother, the Central Board of Revenue, to keep it up to the mark, and to give it news of the progress of its brothers and sisters in the other Provinces. In 1924-25 the department consisted of the Commissioner, three Assistant Commissioners, 27 Income-tax Officers and a staff of 34 Inspectors. The three Assistant Commissioners were employed with headquarters at Lahore, Rawalpindi and Ambala Cantonment, respectively, the Officer incharge of the North-Punjab Division at Rawalpindi being incharge of the Frontier Province Circles also. Two districts only, Lahore and Amritsar, required two Income-tax Officers each, the remaining income-tax officers being incharge of one or more districts each.¹

The results of the first four Reform years' working are shown in the following table;—
Working of the Department.

Years.	Assessees.	Demand Income-tax and super- tax (Rs. lakhs.)	Collection (Rs. lakhs)	Arrears at close of years. (Rs. lakhs.)
1921-22 ..	21,587	59	57	49
1922-23 ..	24,683	75	82	37
1923-24 ..	23,363	71	78	16
1924-25 ..	27,136	88	61	10

The year 1923-24 marked a slow but distinct advance towards India's commercial recovery, an advance which

¹ P.A.R. (24-5) 104-5.



was generally but not entirely maintained during the year 1924-25. The piece-goods market of Amritsar shewed an upwards tendency from November 1923 to February 1924 after which business became dull mainly on account of the prevalence of plague, which discouraged outside traders from visiting Amritsar. The increase in the number of assesseees throughout the Province was due more to the activities of the Department than to any increase in trade. Of the total demand of Rs. 68 lakhs in 1924-25 no less than Rs. 11.2 lakhs was recovered from bankers. Most of these may fitly be described as money-lenders. No less than one out of every four assesseees was a village money-lender. Banking and money-lending yielded nearly as much as the whole amount collected on account of salaries (official or otherwise) (Rs. 11.9 lakhs) and more than twice the amount derived from manufacture and industries (Rs. 4.5 lakhs). The assessment of the money-lender bristled with difficulties. Accounts were seldom produced, and in the few cases when they were produced were found to be hopelessly incomplete. In the case of a money-lender who did produce accounts and was able to convince the Department that they were complete and genuine, it was usual to assess on a cash basis, that is, the actual cash receipts of the assessee from interest during the year. In the case of the majority of money-lenders assessed, all that the Department was generally able to do was to arrive at the approximate value of the loan capital out at interest and to calculate the probable interest received thereon at the rates of interest normal in the vicinity. Such assessments could not legally be disputed by assesseees who had failed to produce proper accounts of their own.¹

Income-tax was generally assessed by applying standard rates of profit to the business transactions of a firm. This was the only method possible when the assessee failed to produce accounts of such a nature that an accurate profit and loss account could be based thereon. In the Punjab these standard rates were obtained by deducting from

Methods of
assessment.

¹ P.A.R. (1924-25) 106-7.



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WESTERN THEORIES AND EASTERN PRACTICE

assumed gross rates of profits, such items as rent of business premises, pay of servants, interest on borrowed capital and so forth, not including of course such items as must of necessity be taken into consideration in every business in fixing the retail sale price in relation to the cost price, such as octroi, railway freight, cartage, and so on. In the United Provinces, on the other hand, net rates of profits were assumed after making allowance for every possible form of business expenditure except the one item of interest on borrowed capital. The difference between the standard rates of profits assumed in the two provinces was small, and as a result the assessee in the Punjab was treated with much greater liberality than his brother in the United Provinces. Assesseees systematically tended to understate their sales. Credit sales were generally entered, but it was extremely easy to enter cash sales as considerably, less than in fact they were. One very simple method was to enter as the total cash sales at the end of the day the balance of the cash received after expending therefrom sums on behalf of the proprietor's private expenses or other cash purchases. Understatement of this kind explained the anxiety of the average assessee to have his assessment based on a percentage on the total of his sales. The great mass of business in the Punjab, with the exception of some of the larger concerns, was entirely in the hands of one proprietor, or of one family of proprietors, who were not concerned to work out year by year the actual profits, so long as the business appeared to be progressing satisfactorily and providing for the wants of the assessee and his family, and it was this fact more than any other that prevented an improvement in business accounts in the Province.¹

¹ P.A.R. (1924-25) 108.



8. NON-CO-OPERATION AND THE SIKHS.

In those days there was no king in
Israel : every man did that which
was right in his own eyes.

Judges xxi, 25.

Financial problems might well have absorbed the attention of the Punjab Reforms Government ; but the last thing that interested the Finance Member was finance. A steadfast upholder of the Congress cause in the days of Sir Michael O'Dwyer, the newly appointed Finance Member was clearly marked out for the only post in the new Government which was allotted to an official. Once in authority, his activities mainly resembled those of a witch-doctor smelling out the anti-Congress heresy in reactionary O'Dwyerians. Sir Michael O'Dwyer's regime had won the passive support of the whole rural community. But the average peasant was too occupied in ploughing the fields and scattering the seed, in marrying and giving in marriage, in borrowing and litigating, to have much time to spare for the defence of a Government which he believed amply able to defend itself. Apart therefore from his devoted officials, who relied on him as much as he relied on them, the loyalty of the masses was secured by a steel-frame work of non-officials bound to Sir Michael O'Dwyer by the mutual ties of services rendered and favours received. Many of them ex-soldiers, these were the men who helped to break the Sikh and Muhammadan uprisings at the beginning of the War, who during the War were foremost in the recruiting campaign and at its end rallied to the side of Government during the rebellion of 1919. Drawn mainly from the rural classes, they were slow to realise the changed attitude of Sir Edward Maclagan. Their delusions were fostered by the grant of worthless scraps of paper (known as *sanads*) whose gushing gratitude they fondly estimated at its face value. Soon however the more intelligent began to realise that the real rewards, the posts of honour and profit, went not to those who had helped to win, but to those who had hoped to lose, the War.

WESTERN THEORIES AND EASTERN PRACTICE

For time is like a fashionable host.
 That slightly shakes his parting guest by the hand ;
 And with his hands outstretched as he would fly.
 Grasps in the comer ; welcome ever smiles.
 And farewell goes out sighing.¹

“ Past sacrifices are nothing,” said Disraeli’s politician,
 4 “ present sacrifices are the things we want ; men who will
 sacrifice their principles and join us.” His political cynicism
 was reflected in that of the Indian Commissioner, when in-
 terviewing a stalwart Sikh officer just back from the
 banks of the Tigris. When the former had finished shewing
 the medals won on the heights of Gallipoli and in the plains
 of Mesopotamia. “ You have fought and fought well,”
 (said the smiling Commissioner) “ but you have made one
 mistake, you fought on the wrong side.”² The manly heart
 of Mr. J. P. Thompson, Sir Michael O’Dwyer’s old Chief
 Secretary, was wrung with the wails of the many others who
 now discovered that they too had fought on the wrong side.
 But one province was too small to hold Mr. J. P. Thompson
 and the Finance Member ; the former was soon kicked up-
 stairs into the Government of India and the quondam
 loyalists, like the Anglicans under James II, were left head-
 less and helpless. Persecuted by its enemies, betrayed by
 its natural head, no body is less able to defend itself than
 one whose only creed is loyalty—once the object of its
 loyalty deserts it. An opposition must create its organisa-
 tion or it will cease to exist. A loyalist body relies on the
 organisation provided for it by the Government it serves.
 Experience had now shewn that loyalty to one Governor,
 so far from earning his successor’s gratitude, might be reckon-
 ed as proof-positive of disloyalty to the new regime.

“ Use the memory of thy predecessor fairly and
 Sir Edward tenderly, for if thou dost not, it is a debt
 MacLagan and will sure be paid when thou art gone ”³
 Sir Michael O’Dwyer. The Governorship of Sir Edward MacLagan
 is a commentary on the text of the seventeenth century

¹ Shakespeare: Troilus and Cressida III.

² This story was generally believed, probably true, and certainly
ben trovato.

³ Bacon. Essay xi.

philosopher. Hitherto one Governor¹ had differed from another, as one star differeth from another in glory, but never by word or deed had any encouraged criticism of his predecessor. It was indeed in accordance with one of the finest traditions of the Indian Civil Service. Even a hot headed junior, succeeding a man whom he personally detested would bitterly resent any aspersions on the character of his predecessor. Great was the surprise then, when Har Kishan Lal, involved in the banking failures of 1913,² who turning to sedition had been sentenced to imprisonment for life in 1919, was not only amnestied but actually made a Minister (and a Minister for Agriculture forsooth) by Sir Edward Maclagan. This seemed to indicate that enmity to Sir Michael O'Dwyer was the first passport to favour under the new Government.³ It was only the most glaring instance among many. To point the moral still more clearly the Punjab Government got hold of a stupid book, containing some absurd libels on Sir Michael O'Dwyer and having purchased it largely, circulated it among their officers.⁴ In the libel suit subsequently brought by Sir Michael O'Dwyer against the author, every difficulty was thrown in his way, while the defendant was mysteriously supplied with a most confidential file from the secret archives of the Punjab Government.⁵

But an agency was required to carry out the new policy. Ultimately the new Government could only work through its officials, and these were bound by ties of honour and gratitude to the loyalists of the old régime. The statesmanlike policy of Sir Michael O'Dwyer had avoided transfers as much

¹ I use the general term Governor for the ruler of the Province, though technically all the rulers prior to Sir Edward Maclagan were Lieutenant-Governors.

² P. 28.

³ When visiting the Mianwali Jail in 1921 I came upon a political prisoner, who, referring to Har Kishan Lal, complained bitterly that his abuse of Government should have landed him not in high office but in jail. I could not give him the obvious reply, that he had not abused Sir Michael O'Dwyer's Government but that of his successor.

⁴ O'Dwyer 334.

⁵ O'Dwyer 337-8, 367-8.



as possible; and this policy was greatly facilitated by the embargo laid on leave during the War. The ensuing epoch witnessed a game of general post, in which officials were not allowed to remain sufficiently long in any district to acquire any influence with the inhabitants.¹ An adverse report from the local branch of the Congress was sufficient to secure the immediate transfer of an obnoxious official, and the continuous application of this method soon broke the heart of those who were not willing to take orders from these incipient soviets. Had the Congress had any idea of Government it might have permanently established the Hindu rule so desired by its politicians, but events were soon to shew that it was easier to break down authority than to restore it, and that a staff of bullied discontented officials was a bruised reed in the day of trouble. It was this breakdown of authority rather than the operation of the Reforms Scheme that was responsible for the grave increase of general crime that characterised the early years of the Reforms.²

Sir Michael O'Dwyer had
Rooted out the slothful officer
Or guilty, which for bribe had winked at wrong.
And in their chairs set up a stronger race
With hearts and hands, and moving everywhere
Clear'd the dark places and let in the law.³

But corruption flourished with the weakening of administrative standards under his successor and the virtuous posturings of sea-green incorruptibles on Bribery Committees drew attention to a disease which they did nothing to remedy. The corrupt official could easily square a Bribery Committee when his Deputy Commissioner had no longer the time or the inclination to keep him occupied with work, and to see that that work was efficiently and honestly performed.

The political obsessions of a Government which despised the details of administration were reflected in the organization of the new district of Sheikhpura. A no man's land

¹ I have given in Appendix VI a rhyme written by a sufferer. Whatever its demerits, it should be prized by historians as an original contemporary document.

² P.A.R. (1923-24) 14.

³ Tennyson. Idylls of the King. Geraint and Enid.



made up of the most inaccessible parts of the old Gujranwala, Sialkot and Lahore Districts, it had been a centre of disturbance in 1919, to quell which a special officer was appointed. This officer had denominated Chuharkana, a rising commercial centre, as the obvious headquarters of the new district. But he was a reactionary, censured for the efficiency with which he had suppressed rebellion; and to the mentality of the new Government, this was a sufficient reason for rejecting his suggestion, and building a new city on a barren waste ten miles away from Chuharkana and also from the railway junction. The new city itself was typical of the new régime, and seemed designed to expend the maximum sum on road metal combined with the minimum facility for getting from any one point to any other. The main buildings faced all in different directions, the only method in their madness being a united determination to turn their backs on the only useful thoroughfare in the town, the highway through Sheikhpura from Lahore to Mianwali. Consequently all that the visitor to Sheikhpura could see of that a Utopian city was a few elevated dunghills, the mortuary, the backside of the jail, and the Assistant Surgeon's female quarters. The residences constructed by a sympathetic Government for its own servants were so jerry-built that many of the latter lived elsewhere. But they had to pay the rent, croaking a feeble chorus of envy for the benefit of the Public Works Department constructor as he departed on an expensive tour to Europe at the conclusion of his duties. The district itself was worthy of its headquarters. It combined the maximum of novelty with the minimum of administrative convenience. Not a single old tahsil boundary or headquarters was retained, yet no area was conveniently situated with respect to its new headquarters. But only a map can portray this madness. It must be seen to be believed.

To the more sophisticated, mal-administration of Non-co-operation this kind appeared due to a Machiavellian design to disgust the populace with the Reforms. But the design, if there was one, was frustrated

by the refusal of the Congress party itself to accept the Reforms Scheme. In demanding an immediate grant of complete self-government the Hindu politicians shewed more political prescience than they were given credit for. The spread of democratic doctrines would (as in fact it ultimately did) weaken the ascendancy of the Hindu oligarchy, unless by seizing power immediately if could once and for all mould the new constitution to its will. In this attitude of non-co-operation it obtained the sympathy of the political Muhammadans, who were becoming increasingly dissatisfied with the anti-Turkish policy followed by Lloyd George's Government in England, and of the rural classes who were now thoroughly disgusted with a Government which had deserted them. In May 1920 the announcement that Turkey had been granted peace on very unfavourable terms caused widespread disappointment amongst Muhammadans throughout the Province and the Central Khilafat¹ Committee used the occasion to work up a number of its followers in Sind to embark upon an ill-fated pilgrimage² to Afghanistan as the only country fit for true believers to dwell in. As they passed through the Punjab the pilgrims³ were met at important stations by sympathizers whose fanatical speeches soon popularised the movement and induced more and more Muhammadans to join the secessionists. For some weeks there was a steady exodus, but when in August the Afghanistan authorities declined to admit any more pilgrims within their borders, the end came abruptly and disillusionment produced something of a reaction of feeling.

One community however still remained to be antagonised. With the Sikhs ever since the Sikh Dissatisfaction. Mutiny loyalty to the British had been a tradition, and Sikh prestige had been much enhanced by the *esprit de corps* of Sikh regiments. The conspiracy of 1915⁴ had not affected the Sikh community as a whole, and in the War the proportion of Sikhs recruited was larger than that of any other community, and their valour in the field had been second to none. At the end of the War they

¹ p. 34.

² *Hijrat*.

³ *Muhajirin*.

⁴ p. 34.



were actively loyal and justly proud of the part they had played in the War.¹ But their love of excitement involved some of the more hot-headed in the disturbances of 1919, and many of those who suffered at Jallianwala Bagh² were Sikhs. But their emotional temperament lent itself to exploitation by others who were cooler headed (whether Government or Congress), and did little to benefit the Sikhs themselves, none of them having the mental agility of a Har Kishan Lal.³ Bitterly resentful of the indifference of the Maclagan Government to their military services, they found a new grievance in their representation in the new Punjab Council, which was proportionate only to their actual numbers⁴, and not commensurate with the importance of the Sikh community as a whole or its loyal record in the past. Moreover the Pecksniffian attitude of the new Government towards alcohol did little to conciliate a community which compensated itself for its total abstinence from tobacco by a generous indulgence in the bottle which cheers and also inebriates. No wonder a loyal Sikh magnate explained, "How long can a Government last from which its friends have nothing to hope, its foes have nothing to fear?"⁵

Dissatisfaction of this type lent weight to a more substantial grievance, which had its roots in the beginnings of Sikh history. Sikhism had assumed two very different forms at different periods in the tolerant quietist doctrines of Nanak and the military propaganda of Govind Singh⁶. The admission of all castes to equality by Guru Govind Singh disgusted many of the higher classes. They refused to accept his teaching, though they remained faithful to the tenets of Baba Nanak; and thus a schism arose in the faith. These two forms were still represented in the Punjab. Strictly speaking the followers of either Guru were entitled to call themselves Sikhs, a word said to be derived from the same root as the common Hindu term Sewak and meaning nothing more than a discipline;

¹ O'Dwyer 204.

² p. 55.

³ p. 121.

⁴ The Sikhs numbered only about 3 millions out of a total Punjab population of 20 millions (excluding Native States).

⁵ O'Dwyer 305-6.

p. 8.

but while the followers of first Guru, or Nanki Sikhs were Sikhs, they were not Singhs, which was the title by which the followers of Govind, or Gobindi Sikhs, were distinguished. In common practice however only the latter were termed Sikhs and ordinarily regarded as such, the vast majority of those who professed only the tenets of Nanak calling themselves Hindus, though the more educated of them would explain that they were at the same time Sikhs, though not Singhs. These Nanki¹ Sikhs were distinguished by no outward sign, had no peculiar customs or observances, and though they revered the Granth², and above all the memory of their Guru, had little to distinguish them from any other Hindu sect except a slight laxity in the matter of caste observances. They did not wear the hair long or use any of the outward signs of the Singh, nor did they abstain from the use of tobacco.³

The Singhs or Sikhs *par excellence* on the other hand were easily distinguishable, there being five marks commonly known as the five k's⁴ which they were bound to carry about their persons (1) the *kes* or uncut hair and unshaven beard; (2) the *kachh*, or short drawers ending above the knee; (3) the *kara* or iron bangle; (4) the *khanda* or steel knife and (5) the *kanga* or comb. To become such a Sikh a man had to be born again. He left his mother's womb a Hindu or perhaps a Nanki Sikh, but he only became a Govindi Sikh when he received the baptism of initiation⁵ instituted by Guru Govind. This baptism could only be conferred when the candidate had reached an age of discrimination and remembrance, seven years old at the earliest, the rite being often deferred till manhood. No ceremonial was fixed, but five of the initiated had to be present, one of them learned in the faith. Sugar and water were stirred up with a two-edged dagger, the novice repeating after the officiant the articles of his faith. Five times was this water sprinkled

¹ Also called Nanakpanthi, Sajhdari or Munna (shaven) Sikhs.

² The Sikh Bible (see p. 9).

³ P.A.R. 652.

⁴ Kakka.

⁵ Pahul.



on him with the dagger ; five times did he drink of it from the palm of his hand. He then pronounced the Sikh watch-word " Hail Guru " and promised adherence to his new faith. From that date he had to wear the five k's and change the second term of his name to Singh. On the few occasions when women were initiated a one-edged dagger was used. Thus the children of true Sikhs did not necessarily follow the religion of their parents. It was quite common to find one brother a Hindu and another Sikh. As for the women, Hindus and Sikhs intermarried freely.¹

The Sikh
shrines.

The War had revived the old Sikh military spirit which was identified with the name of Govind Singh. Religious revivalism drew attention to the fact that many of the Sikh shrines² were mainly Sikh in the old sense, following the principles of Guru Nanak without any insistence on the militant doctrines of Guru Govind Singh. Sikhs of every kind and even Hindus worshipped at the Sikh shrines without much discrimination. Many of these shrines had large grants of land, whose value had been greatly enhanced by recent extensions of canal irrigation. This suddenly acquired wealth often diverted the abbots³ in possession from the life of austerity to which they should have been devoted, while providing a magnet for the cupidity of others. In fact it provided both the motive and the justification for their ejection and replacement by self-constituted reformers, who put forward the additional plea that true Sikhism (after the order of Guru Govind) was not followed in these professedly Sikh shrines. Similar motives inspired the Protestant Reformers in England to plunder the monasteries ; and there, as in the Punjab four centuries later, a movement which was religious in its origin rapidly acquired a political character.⁴ The reforming Sikhs now challenged Government control over the Sikh College at Amritsar,⁵ and the right of Government to appoint the Manager of the Golden Temple,⁶ though this latter was an arrangement of no less than 50 years

¹ P.A.R. 653.

² Gurdwara.

³ Mahant.

⁴ P.A.R. 655.

⁵ The Khalsa College.

⁶ p. 55.



standing. In 1919 a Sikh League was formed to guide Sikh political opinion. In 1920 the original office holders of the League were ousted, in favour of others, whose hostility to Government emulated the extreme left wing of the Congress party. In October 1920 Mr. Gandhi induced the League to support his policy of boycotting Government schools, the new Reforms Council and goods of European manufacture. Branches of the League were founded in all the districts of the Central Punjab, which from the first assumed a more aggressive attitude than the parent body, due probably to the admixture of returned emigrants¹ in the rural committees. The lapse of the League itself from constitutional methods dated from the attentions of Mr. Gandhi and his lieutenants, who flattered Sikh self-esteem by reference to their martial history and religious zeal.

Mr. Gandhi's visit to Amritsar in October 1920 had other significant results. The students of the Sikh College responded enthusiastically to the magnetism of this mystic personality. They went on strike and several professors submitted their resignations, with the result that Government voluntarily relinquished its control over the institution. Impatience of official supervision presently manifested itself in a desire to place the management of the Golden Temple also on a footing equally satisfactory to Sikh sentiment and the ardour of the extreme reformers displayed itself dramatically when one Teja Singh suddenly seized the Akal Takht, the central shrine of Sikhism, adjoining the Golden Temple. Government admitted the claim without hesitation, but was naturally apprehensive of the results which might ensue from surrender to extremist control. Consultation followed, and a new Committee of management emerged with 179 members under the name of the Shiromani Gurdwara Parbandhak Committee.² The seizure of the Akal Takht at Amritsar was made the occasion for a series of similar demonstrations. At Sialkot the widow of the deceased abbot had come under the influence of a short-haired trustee,

¹ p. 33.

² The Sacred Shrine Management Committee.

who appropriated the revenues of the shrine in the name of the widow's minor son though he was denounced by the reforming party as a loose liver and an apostate from the Sikh faith. A civil suit brought by the local Sikhs resulted, after unconscionable delays in the Civil Courts, in their being called upon to pay some Rs. 1,200 in court fees. This they declined to do and instead took forcible possession of the shrine, which they were allowed to retain. The example spread. Other shrines were forcibly occupied, not without bloodshed. Like the lady in the epic, who often

“Strove, and much repented,
 And whispering, I will ne’er consent, consented.”¹

the emasculated Government could neither grant gracefully nor resist firmly the demands of the virile Sikhs. But the struggling surrender

“Yielded with coy submission, modest pride,
 And sweet, reluctant, amorous delay”²

so fascinating too in the sex, was (in the eyes of the Sikhs) less fascinating in a Government. They called it weakness, and increased their demands accordingly.

The lawlessness of the Sikhs differed not so much in kind as in degree from the general lawlessness which was spreading throughout the Province. The central districts were at the mercy of gangs of robbers, who made travelling dangerous by day and impossible by night. Life and property in the west were threatened by bands of outlaws, who after robbing and murdering disappeared (often with some unhappy hostage) into the mountain fastnesses of the Frontier or the Salt Range. Everywhere the fatherless and widow and the weak generally were oppressed; and unprotected women were raped or carried away into captivity. The rich and powerful kept gangs of hired ruffians who terrorised the quieter inhabitants of the country side. The disorder spread to the towns; and the roistering bullies employed in the feud between the President and the Vice-President of the

¹ Byron. *Don Juan*. i. 117.

² Milton. *Paradise Lost* IV.

Municipal Committee nightly awakened the honest citizens of the growing town of Sangla with their scurvy swashbuckling. Amidst the general confusion the Sikh bands were distinguished by their quasi-military discipline and their political ambition aiming first at the capture of the Sikh shrines and ultimately (perhaps) at the domination of the rulerless Province. The Sikh bands found their uniform in the dark blue turbans and the large swords¹ of the Nihangs, a band of devotees founded by Guru Govind Singh; and with their numbers the length of their swords began to increase. These Akalis, as they called themselves were from the first prominent in the attacks on the Sikh shrines. Local bands² of Akalis began to form themselves with singular and almost mechanical frequency. The old fighting spirit of the Sikhs was abroad in the land, and orthodox Sikhs of every rank and condition rallied to its awakening. Whatever the objective of the moment, every Sikh is at heart a crusader in the cause of his religion, and it was without doubt religion, puritan and perfervid, which called into being the new formations. The Parbandhak Committee early realized the importance of the Akali cult in the furtherance of its particular aims; and the support which it gave to the movement, once it had discarded the old Sikh idea of dependence upon Government and definitely assumed the task of moulding Sikh destinies, was in itself a powerful reinforcement. A recruiting campaign was initiated in all the Sikh districts and the Akali Dal³ presently took the shape of a volunteer army, designed by weight of numbers and moral pressure to force a solution of the problem of the shrines.

The confidence of the Sikhs increased with the The Massacre growing disinclination of the Government at Nankana. to face the issue. Still nominally supreme, and invested with all the trappings of power, the Governor resembled a Holy Roman Emperor in his waning prestige and the dimmed lustre of his office. His

¹ *Kirpan*.

² *Jatha*. The word *jatha* in Punjabi is applied to any group of men, but it was used by the Akalis in a technical sense to indicate a quasi-military organised group.

³ Army of God.

mysterious motives resembled those of the Emperor Maximilian. "He consulted with no one, yet never got his own way in anything. A secretive man, he does not communicate his designs to anyone, nor does he receive opinions on them. But as in carrying them into effect they become revealed and known they are at once obstructed by those men whom he has around him and he, being pliant, is diverted from them. Hence it follows that those things he does one day he undoes the next, and no one ever understands what he wishes or intends to do, and no one can rely on his resolutions."¹

Unfortunately events were fast hurrying towards a crisis which demanded courage and resolution. The reforming Sikhs had long had their eye on the great shrine at Nankana, the reputed birthplace of Guru Nanak. The revenues of this shrine had been greatly increased by the extension of Canal irrigation to the pasture lands allocated to the shrine and in 1920 amounted to some half million rupees per annum. During the last half of 1920 the Sikhs had been discussing an attack on the shrine and the Abbot² repeatedly applied to the Commissioner for protection. In reply he was told to sue in the courts for an injunction to restrain individuals bearing arms from entering the shrine. Such an injunction would have to be issued against all male Sikhs of military age, any of whom might attack the shrine. Moreover it was unlikely that Akalis, who were bent on the forcible ejection of a man in lawful possession, would pay much attention to so ineffective a weapon as an injunction. Instead of acting on the advice, therefore, the Abbot hired a band of Pathan desperadoes, and publicly announced that he intended to resist an attack, and that the Commissioner had advised him to do so. His preparations seem to have scared the Akali organizers, who postponed an intended attack on the shrine.

But the atmosphere was electric, and the Abbot was tense with hate and fear. On the 19th February 1921 he

¹ Machiavelli: *The Prince*, xxiii.

² *Mahant*.

was bound for Lahore to attend a meeting of Nanki Sikhs. But before the train left the station a woman called out to him "The Akalis are coming." Returning he learnt that an Akali band was in the neighbourhood. This band, which numbered about a hundred, was a private one, marching from an Akali meeting in the Lyallpur district to another in Amritsar. As Nankana lay on their route the Sikhs determined to pay an early visit to the sacred shrine, and worship there.¹ The Abböt, however, never doubting that they purposed to seize the shrine, was ready for an attack.

The shrine itself, like all ancient temples,² was situated in a courtyard surrounded by porticos and rooms whose flat roofs formed a complete pathway surrounding and commanding the courtyard. It was still pitch dark on that cold February morning when the Sikhs entered the courtyard. The great gates were open and they suspected nothing. No sooner were they all (or nearly all) inside than the gates were unexpectedly shut. Then followed a slaughter grim and great. Those of the Abbot's Pathans, who had rifles, directed their fire on the Sikhs below. When the latter were thoroughly demoralised, the Pathans sprang down into the courtyard and hacked them to pieces with long knives. A remnant took refuge in the Holy of Holies in the centre, where was the sacred Granth Sahib.³ But a hole was cut in the door and rifle fire was directed on the huddled masses inside. The sun had long risen when the ghastly work was finished. The bodies of the dead and dying were heaped together and were drenched in kerosine oil, which had been stored in advance, fresh supplies being obtained at famine prices from the bazaars of Nankana. Outside, all that could be heard was the firing of rifles and the shrieks of the victims, succeeded by the smoke of the infernal funeral

¹ That their intentions were to worship at, and not to attack, the shrine seems clear from the circumstances; and was also attested by leading Hindus on my visit to Nankana in 1927. As this point tells against the Abbot, with whom these Hindus were obviously in sympathy, I have no hesitation in accepting this as the true version of the incident.

² The classical example was Herod's Temple at Jerusalem.

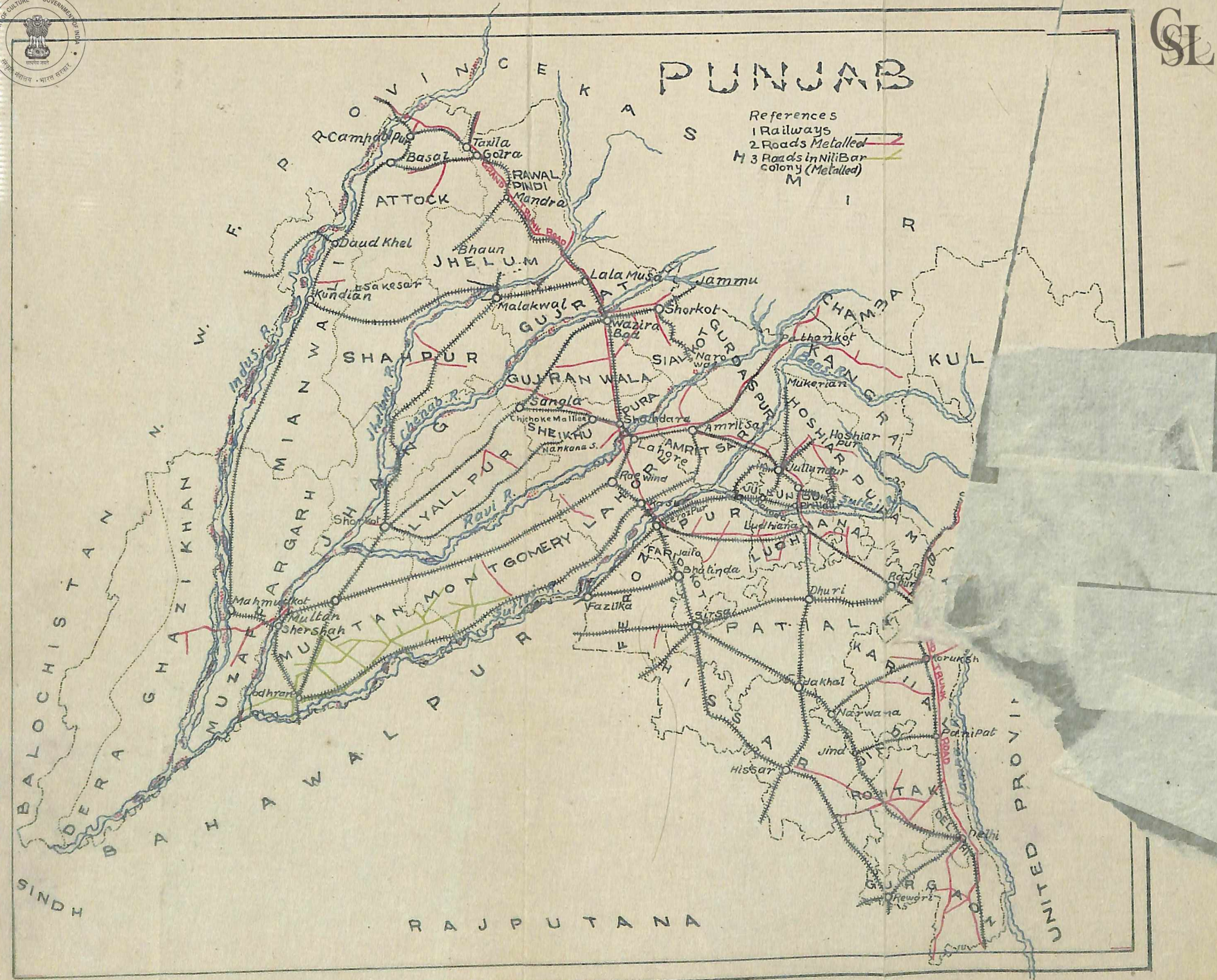
³ The Sikh Bible.



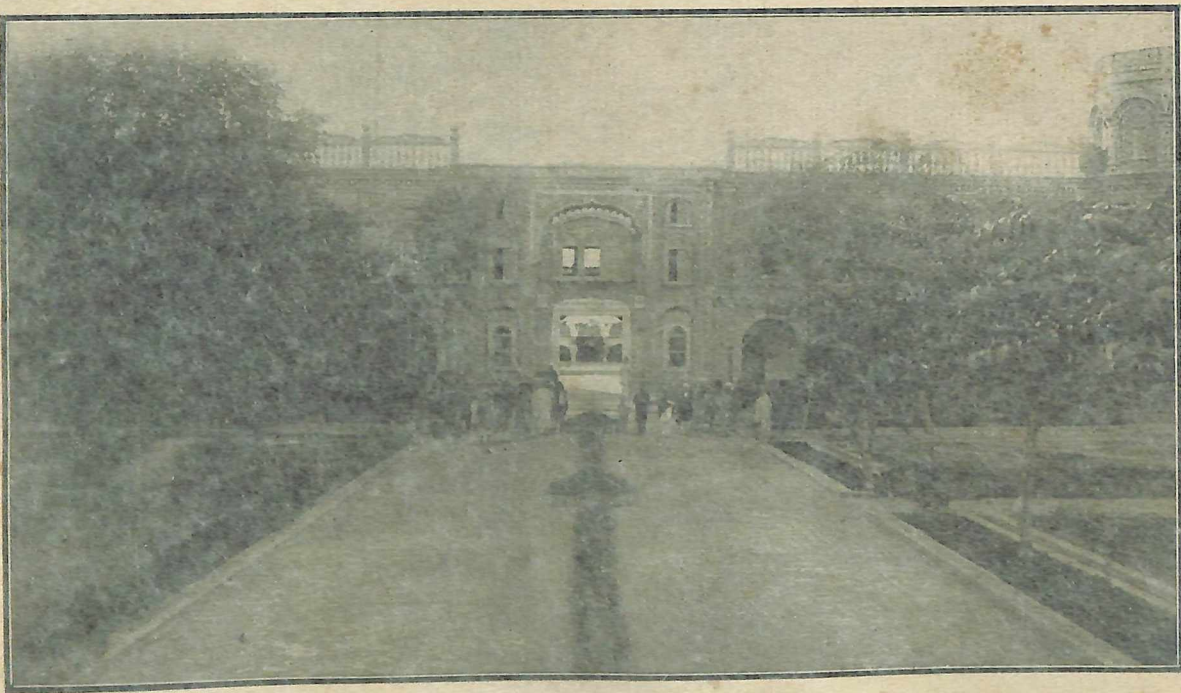
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- References
1 Railways
2 Roads Metalled
3 Roads in Nili Bar colony (Metalled)
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Gateway into the Interior, where the Holy of Holies is just visible. This gateway was locked by the Abbot after the Sikhs had entered.



*SIKH SHRINE AT NANKANA (Exterior).
The exterior of Gurdwara Janam Asthan (Birthplace of Guru Nanak).*



pyre. The obscene pillar of cloud, towering up to heaven, fouled the eyes and stank in the nostrils of the terrified people of Nankana. Once the bodies of his victims were consumed, the Abbot would have had the ashes conveyed away in bullock carts to the river Ravi, some ten miles off. Twenty four hours would have sufficed to destroy all evidence of the crime, but those twenty-four hours were not vouchsafed to him. By one of those coincidences which the devout ascribe to Providence and philosophers measure in terms of mathematical probability,¹ the Deputy Commissioner happened to be in camp only five miles off. He hastened to the spot, soothed the Abbot, who thought he had nothing to fear, and privily wired for help from Lahore. The number done to death in this appalling affair cannot even now be accurately stated, but it was somewhere between 88 and 135. The Abbot and his accomplices were brought to trial in due course, Government having declared its determination to exact retribution for this act of calculated and barbarous ferocity.

But the Sikhs clamoured for the blood of the Sikh struggle Commissioner, who was universally believed with Govern- ment. to be backing the Abbot, and whose subsequent promotion to the office of Financial Commissioner did much to inflame the Sikhs' distrust. The mysterious illness and departure of the Deputy Commissioner, the still more mysterious death of the Magistrate trying the Abbot, and the refusal of most of the witnesses to give evidence against him, all combined to arouse the Sikhs' suspicion that a Hidden Hand was working against them. They pictured the great Government dinosaur, with its gigantic belly and its diminutive cerebellum, its crocodile tears of sympathy and its jaws gently smiling with insincerity as inspired by the calculated ferocity of a Borgia and the hedonistic scheming of a Machiavelli; and

¹ Taking as data, the lack of communications in the neighbourhood of Nankana and the Deputy Commissioner's methods of touring, the chances were about thirty to one against his being near enough to the scene to get news in time to reach Nankana before the Abbot had destroyed the evidence.

fancied that the foggy follies of the Empire of Dullness were the dark counsels of the Kingdom of Hell. The Parbandhak Committee seized the opportunity to voice the general indignation. A recruiting campaign was initiated in all Sikh districts, and the Akali Dal¹ presently took the shape of a volunteer army, designed by weight of numbers and moral pressure to force a solution of the problem of the shrines.

In March 1922 the High Court delivered judgment on the Nankana case, acquitting 27 accused and reducing the capital sentences to 3.² Deep and sustained resentment was the sequel to this decision in the Akali ranks, already permeated by the spirit of anarchy which now infected all classes alike. An outlet for this pent-in emotion soon presented itself. In August 1922 trouble broke out over the ownership of land attached to the shrine at Guru-ka-bagh near Amritsar. The shrine had been seized by a band of Akalis in February 1922, but the residential quarters and lands remained in the possession of the Abbot. In August the Parbandhak Committee determined to make an effort to secure the land, and five Sikhs trespassed on it and cut down some wood. On complaint being made by the Abbot the trespassers were prosecuted and convicted of theft. The Parbandhak Committee protested against the conviction and claimed that land attached to the shrine was shrine property, and that trees growing thereon were the property of the Sikh community and could be cut down by them for use in the public kitchen attached to the shrine for feeding pilgrims. Volunteers were called up to repeat the original offence; and the episode assumed the nature of a struggle between the Committee and Government as to how long relays of volunteers would be forthcoming ready to undergo beating and arrest. The struggle continued until November, when the incident was closed by the lease of the land in dispute to a third party who gave permission to the Committee to use it. By that time five thousand Akalis had been arrested.

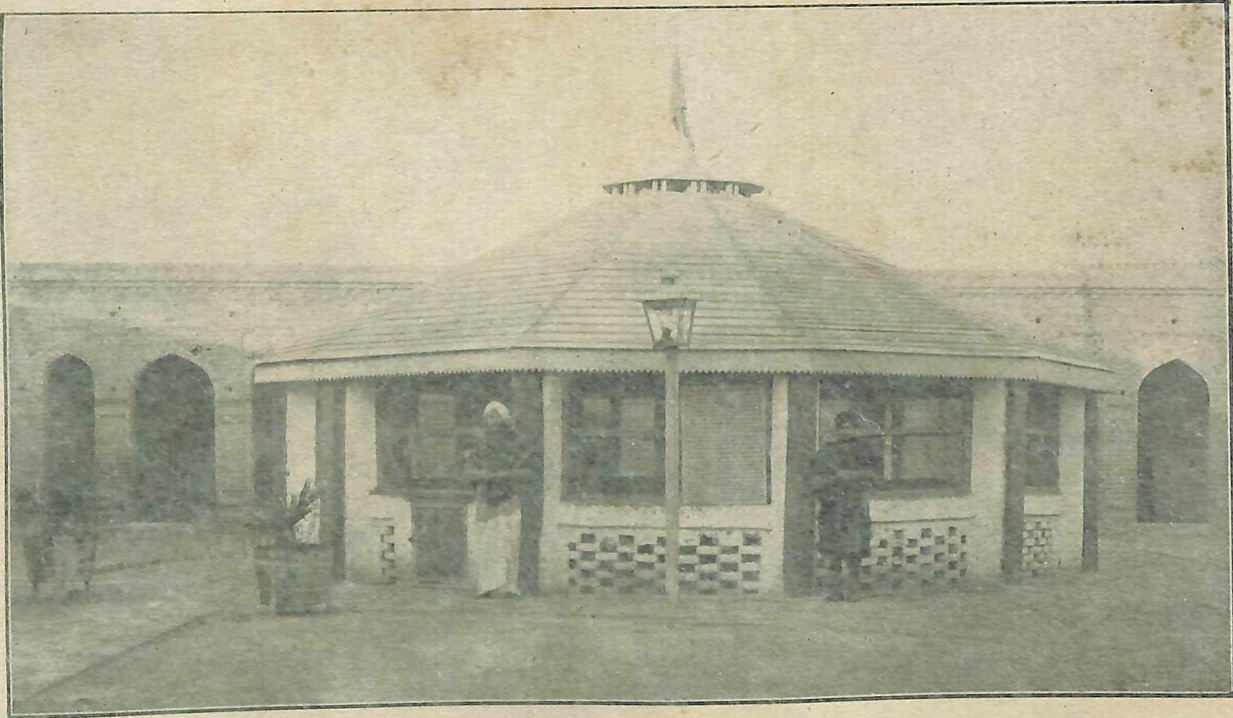
¹ Army of God.

² Thereby shewing how impossible conviction would have been had the Abbot (as he calculated) succeeded in destroying the evidence.

SHAHID GANJ.

Here the dead bodies of 84 victims of Nankana riots were burnt. The board hanging in front of the building indicates their names.

CSL



THE SHAHID GANJ (Martyr House).

Site of the spot where the bodies of the dead and dying Sikhs were burnt by the Abbot, after having been drenched in kerosine oil.



But by 1923 the principles of non-violence were Close of the forgotten and at the beginning of the year struggle. a succession of brutal outrages of an admittedly political nature in the Doaba¹ pointed to the existence of a large gang whose object was to terrorise the countryside and prepare it for revolution by murdering persons known to be assisting the authorities in their efforts to fight sedition. This gang, which named itself the Babbar Akali Band,² from time to time issued leaflets threatening violence against those who opposed their methods. In the space of a couple of months the whole Doaba was terrorised and the local authorities found themselves unable to cope with the situation. The countryside, when not actively sympathising with the Babbar Akalis, was either terror-stricken or apathetic, and the task of unravelling the complicated tangle of a widespread conspiracy and of arresting the absconding members of the gang threw a heavy strain on the Additional Police and the Cavalry who were called in to deal with the situation.

The struggle for reforming the shrines was being gradually identified with the nakedly anti-Government agitation of the non-co-operators. While the struggle raged most fiercely, the Punjab Government was engaged in obtaining legislative sanction to a measure which would have placed many Hindu-Sikh shrines at the mercy of the Akalis to the detriment of Hindu interests. Yet the Parbandhak Committee joined with non-co-operating Hindus in denouncing it. Insincerity of this kind was bound eventually to quench the fire of the movement. The last effort of the Committee was displayed in the despatch of self-styled Bands of Martyrs who marched to Jaito in the Nabha State, where the Maharaja had been deposed and which was then under a British Administrator. Proceeding by circuitous routes these Bands visited nearly every district of the Punjab in the course of their wanderings, distributing Akali propaganda. It remained for Sir Malcolm Hailey

¹ The area in the plains lying between two rivers is termed a Doab (Persian *do* two, *ab* water) but the Doab (Doaba) *par excellence* is the Jullundur Doab between the Beas and the Sutlej.

² Lion Band of Akalis.

who became Governor in June 1924, to discover the final solution of the Sikh problem in a judicious concession to Sikh religious aspirations in the passing of a Gurdwara Act, combined with a firm repression of lawlessness of every kind.

The Sikhs had acted as the spearhead of the Congress forces and by 1924 these forces were becoming disorganised. Different causes had united Hindus, Muhammadans and Sikhs under Mr. Gandhi's watchword of non-violent non-co-operation with Government, and for a time the combination had seemed irresistible. In 1922 Congress Volunteer organizations in Lahore and Amritsar continued to make demonstrations long after they had been declared illegal associations under the Seditious Meetings Act. In several districts force was required to disperse the parties of Volunteers who in the supposed interests of Temperance attempted to interrupt the Government auctions of liquor contracts. On the arrest of a political agitator at Jhajjar in the Rohtak district, his supporters took possession of the Town Hall, hoisted national flags and removed the octroi posts. Order was not restored until the mobs had been forcibly dispersed, a detachment of British troops remaining at Rohtak until the return of normal conditions.¹

But soon rifts appeared in the Congress lute. Events in Turkey culminating in the abolition of the Khilafat² in March 1924 had done much to assuage Muhammadan bitterness against England, and to render Muhammadans still more unwilling to join in a movement which was essentially Hindu in its leadership. The first political collision arose anent the prohibition of the export of wheat by the Punjab Minister for Agriculture, Lala Harkishan Lal, who was also the owner of large flour mills which required a plentiful supply of cheap wheat for their successful working. The prohibition was effected under a War ordinance, whose legality as thus applied was doubtful and which was certainly

¹ P.A.R. (1922-23) 2.

² *Khilafat*=the rule of the Caliph (from Arabic *Khalifa*=Caliph). The Sultan of Turkey was also the Caliph or religious head of Islam.



never intended for that purpose. It forced the cultivating classes, the majority of whom were Muhammadans, to sell their wheat cheaply to the Hindu mill-owner. The hardship was particularly felt in 1922, when a series of bad harvests were succeeded by a bumper crop far in excess of India's needs. The situation reached its climax in a Resolution brought by one of the members of the Legislative Council in favour of removing the prohibition on wheat export. Mr. Jacob, I.C.S., the Director of Agriculture, had lost no opportunity of pointing out to the Minister that the prohibition of export was unfair to the agricultural producer and could only result, if persisted in permanently, in discouraging the growing of wheat, which could not be produced economically at these prices. The Minister, Lala Harkishan Lal, however, took the opportunity of the debate to make a virulent personal attack on Mr. Jacob, his own subordinate, Agriculture being a transferred subject. The attack, however, lost much of its force from the fact that on a division the resolution was carried, Mr. Harkishan Lal putting the finishing touch to his extraordinary conduct by abstaining from voting. The prohibition was ultimately withdrawn, but in the meantime Muhammadan discontent had come to ahead in fierce riots at Multan, where, owing to the low price of wheat, the Hindu money-lenders restricted credit and endeavoured to recover their loans through the Civil Courts. In the eastern Punjab Muhammadan animosity was aroused by the attempt to introduce the Hindu Shuddhi¹ movement from the United Provinces. Conversely the Hindu community bitterly resented the outrages committed against Hindus in the south of India in the Muhammadan Moplah rising, while they were none too enthusiastic over Turkish successes, viewing Islamic pretensions with genuine and undisguised alarm.

They soon found a fresh object for their fears nearer home in Sir Fazl Hussain, the Muhammadan Minister for Education. This astute politician had qualified himself

¹ A Hindu missionary movement for the conversion to Hinduism of those of other faiths (p. 94).

for a place in the Reforms Government by the fact that he was stated to have been marked down for arrest by Sir Michael O'Dwyer. But it was characteristic of him that he was never actually arrested, and his public embracings of Harkishan Lal and Sir John Maynard¹ could not disguise the fact that he was using his ministerial powers to further Muhammadan interests. Sir Fazl Hussain was indeed fast emerging as the one member of the Reforms Government who was gifted with the insight of a statesman.² He realized that the Hindu money-lender was hateful to the peasant and particularly to the Muhammadan peasant, and that the pact patched up between Hindu and Muhammadan politicians was contrary to eternal verities and could not endure. But his astute mind had also grasped the fact that the rural representatives were a majority of Legislative Council, could they be induced to act unitedly. This he soon taught them to do, and the urban Hindu learnt to quail before him. All-India Congress Leaders vainly combined the wisdom of the serpent with the gentleness of the dove in their endeavour to assuage the growing communal bitterness in the Punjab, where the cause of Hindu-Muhammadan unity under Congress leadership was now³ irretrievably lost.

9. THE LEGISLATIVE COUNCIL.

Measure not dispatch by the times of sitting, but by the advancement of the business.

BACON, Essay xxv.

The futility of non-co-operation became the more evident as the machinery of the Reforms of law. Scheme began, slowly and ponderously, to revolve. The Punjab has ever been the Ulster of the Oriental Ireland and the canny Punjabi soon set himself to see what practical good could be got out of this new deity—

¹ The Finance Member.

² i.e., one whose aim is the attaining of some political objection as opposed to a politician whose only objection is his own advancement through politics.

³ 1924.

the Legislative Council—which had descended on him *ex machina*. He fancied that a knowledge of its workings might give him the power to modify a legal system much of which was extremely irksome to him. The indigenous law of India was a law of status, in the case of Hindus derived ultimately from the laws of Manu¹ and in that of Muhammadans from the Quran.² In the Punjab, however, these legal systems only applied strictly to the urban classes. The rural classes followed an agricultural custom, which, though subject to considerable variations, had yet certain underlying principles (*e.g.*, the agnatic rule of inheritance which, however, was considerably modified by the principle of maintenance, according to which, broadly speaking, no helpless dependent was left unprovided for). This custom had, to a large extent, been judicially determined. Reference was, however, often made to the records of custom³ drawn up by Settlement Officers when they revised the land revenue. Punjab custom, unlike that of England, was progressive,⁴ and the Land Revenue Settlements formed a convenient opportunity for recording changes that had occurred.

From the first, however, the necessity was felt for some powers of original legislation. As early as 1773 the Governor-General in Council was given powers to make Regulations subject to the control of Home authorities. These Regulations applied to “all such provinces, as may at any time hereafter be annexed to Bengal.” The Punjab was never specifically so annexed, and was therefore called a Non-Regulation Province.⁵ Doubt arose, therefore, as to the validity of the Punjab Civil Code⁶ the various administrative rules and orders that had been issued by the Punjab Government, and the Bengal Regulations (whose applicability to the Punjab was dubious). To remove this the Punjab Laws Act⁷ was passed, in which all previous legal provisions were consolidated and re-enacted.

¹ L.F.R. 64.

² L.F.R. 105.

³ *Riwaj-i-am.*

⁷ Act IV of 1872 amended by Act XII of 1878.

⁴ L.F.R. 304.

⁵ L.F.R. 193.

⁶ L.F.R. 290-92.

In 1870 provision was made¹ for making rules having the force of law in tracts in an elementary stage of progress. When such tracts had been scheduled by the order of the Secretary of State, the Governor could (after obtaining the assent of the Governor-General² in Council) make for them Regulations having the force of law. In the Punjab the tracts so scheduled were the districts of Mianwali and Dera Ghazi Khan, the tahsil of Leiah in the Muzaffargarh district and the pargana of Spiti in the Kulu sub-division of the Kangra district. Of such regulations the most important was the Frontier Crimes Regulation, which was in force in all the above tracts except Spiti. It empowered the Deputy Commissioner to inflict sentences up to fourteen years' imprisonment on the finding of a Council of Elders,³ the order being subject to the confirmation of the Commissioner in cases where the sentence exceeded seven years, the Commissioner having also revisional jurisdiction in all cases.

"In a state of society where the hereditary blood-feud was an accepted institution and violent crime prevalent, but where a notorious criminal could often count on immunity because no one would dare to give evidence openly, this system was a most valuable adjunct to the more formal processes of the regular courts." In serious cases, where the police failed to obtain evidence that would satisfy a regular court, the Deputy Commissioner could make over the enquiry to a Council of Elders, composed of the leading men of the locality, or from outside if local feeling ran high. This Council made a local enquiry in their own way, partly secret, partly public, recording statements without being bound by the strict rules of evidence and often tapping sources of evidence not known to the police. They then heard what the accused and his witnesses had to say, and like a British jury, came to a definite finding as to the guilt or innocence of the accused. It was then open to the District

¹ Under Act 33 Vict. Cap. 3 (1870) now superseded by 5 and 6 Geo. V. Cap. 61 (Government of India Act, 1915) Section 71.

² *i.e.*, the Viceroy.

³ *Jirga*.

Magistrate, after hearing the accused, to accept the finding, and if this meant conviction to pass a sentence up to fourteen years' imprisonment in very heinous cases. If he disagreed he could discharge the accused or order further enquiry by the same Council of Elders or by a new one. The system was very elastic and on the whole worked successfully, provided that the District Magistrate knew his men and the Council of Elders did their work thoroughly and honestly.¹

Meanwhile the growing legislative confusion in the Punjab Government of India had been dissolved by the Legislative Council of Indian Councils Act of 1861. The three separate presidencies were brought into a common system; the legislative and administrative authority of the Governor-General in Council was asserted over all their inhabitants; while the principle of recognizing local needs and welcoming local knowledge was admitted, so that local Councils were created and a few non-official and even Indian members introduced in an advisory capacity. But partly at least out of anxiety to prevent the authority of the executive from being impaired (as in Warren Hastings' days) by any other rival institution without administrative responsibility, it was expressly declared that the Council were a mere legislative committee of the Government and not the germ of responsible institutions. It was not, however, till 1897 that a Council of nine members was actually established in the Punjab and "as the system of election was still looked on with suspicion by the majority of the population it was entirely nominated."² The powers of the Punjab Council so constituted were purely legislative and were exercised subject to the control of the Governor-General in Council, to whom all Bills containing penal clauses were submitted for previous sanction, and to whom also every project of law was forwarded for transmission to the Secretary of State before it was introduced into Council. Before any measure carried through the Council could become law, it required the assent of the Lieutenant-Governor and of the Governor-General in Council.³

¹ P.A.R. 101, 140-42; P.A.R. (1922-23) 9; O'Dwyer 45, 122.

² O'Dwyer 371.

³ P.A.R. 143-4.

Meantime the prolonged rule of the Conservative Morley-Minto party in England had ended in the debacle of 1905, and with the advent of the Liberal party to power, came an increased sympathy with the doctrines of the Congress party and a determination to make a further advance in the direction of self-government. Lord Morley, the new Secretary of State for India, was faced with the difficult problem of fusing in one single government the two elements which he discerned in the origins of British power in India. He hoped to blend the principle of autocracy derived from Moghul emperors and Hindukings with the principle of constitutionalism derived from the British Crown and Parliament; to create a constitutional autocracy, which differing *toto cælo* from Asiatic despotism should bind itself to govern by rule, should call to its council representatives of all interests which were capable of being represented, and should merely reserve to itself, in the form of a narrow majority, predominant and absolute power. He hoped to create a constitution about which conservative opinion would crystallize and offer substantial opposition to any further change. He anticipated that the aristocratic element in society and the moderate men, for whom there was then no place in Indian politics, would range themselves on the side of the Government, and oppose any further shifting of the balance of power and any attempt to democratize Indian institutions.¹

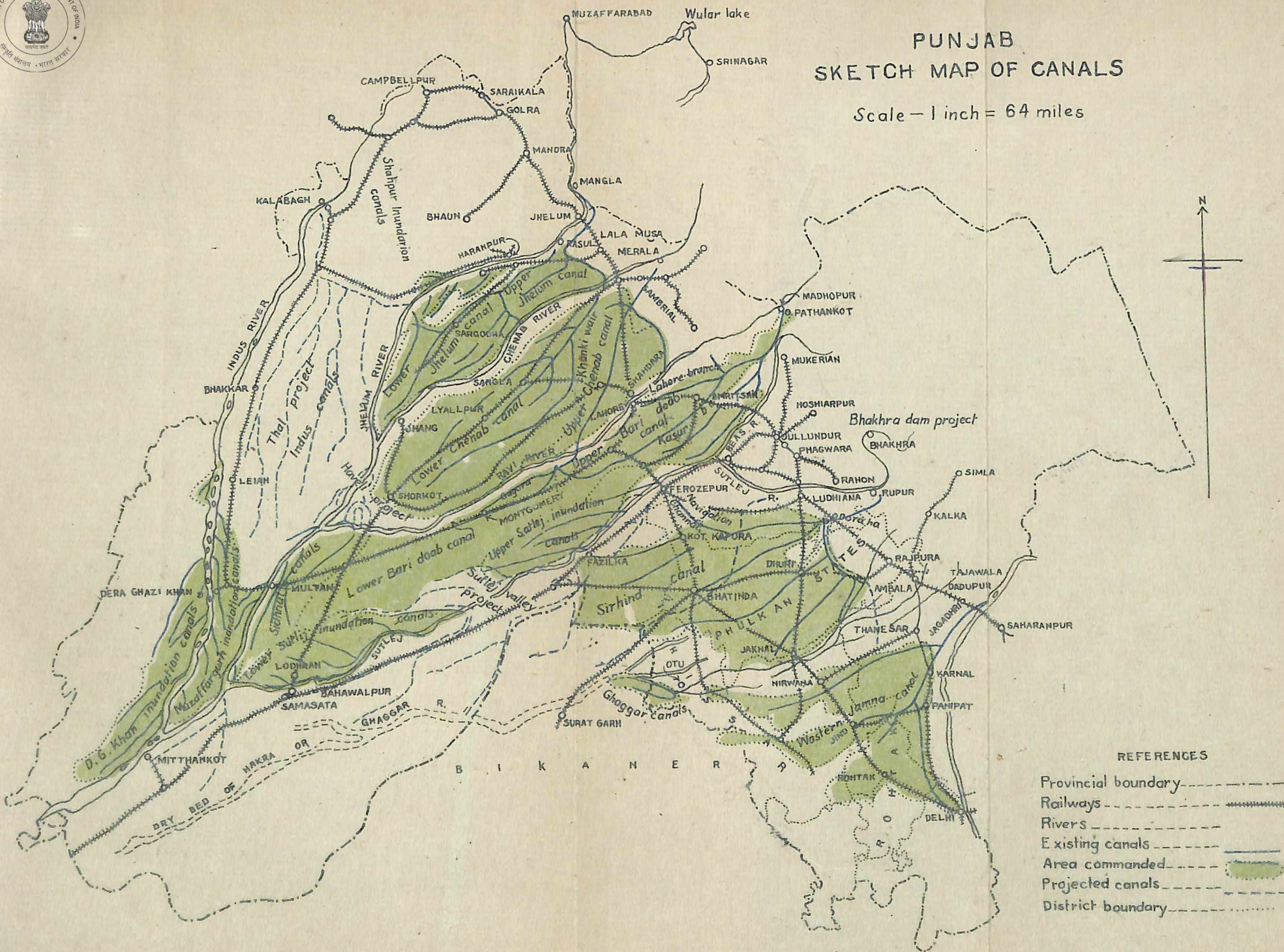
In pursuance of this object the provincial Legislative Councils were considerably enlarged, and were granted power to pass resolutions on the budget or any other matter of general public interest. The principle of election to these Councils was specifically recognized, though the power of nomination was retained to a certain extent. The regulations issued under the Act created non-official majorities in all the provincial Legislative Councils.² At the same time the rules regulating their procedure were so modified as to give them very much wider opportunities of expressing their opinion on administrative matters. Questions might be

¹ P.A.R. 145.

² *Smith India* 777.



Scale - 1 inch = 64 miles



asked and resolutions moved on matters of public interest. Three non-official members sat on the Finance Committee of the Punjab Council and took an active part in the discussions on the Budget.¹ In 1909 five seats were thrown open to election and all fell to Muhammadans, thereby creating a Hindu-Sikh grievance. In 1912, of six seats open to election four were carried by Hindus, one by a Sikh, and only one by a Muhammadan, thus creating a Muhammadan grievance, as the Muhammadans were the majority of the population. The number of elected seats was then increased to eleven, so as to obtain a wider representation and the number of official members reduced to eleven; but to rectify anomalous results among a people by whom election was generally neither desired nor understood, six seats were reserved for nominated Indians. These measures being cautiously progressive, met with the approval of all communities. For in the Punjab, elections then, as now, followed communal lines, and a member of the Congress party who visited the Province in the autumn of 1917 to stir up interest in the new Reforms Scheme, complained that he had met there Hindus, Muhammadans, and Sikhs, but not a single Indian.²

The Morley-Minto³ Council worked well enough. The Reforms in the Punjab, but in other Provinces Council. results were less satisfactory. Non-official members devoted themselves to purely destructive criticism. This was attributed to a lack of that sense of responsibility, which the Montagu-Chelmsford⁴ Reforms were intended to supply. Accordingly the Government of India Act of 1919 bestowed responsible Government on the Provinces the normal life of a provincial Legislative Council being three years. The Governor could only occasionally address the Council but he appointed the first President, whose functions corresponded to those of the Speaker of the House of Commons, and who retained his office for four years. Subse-

¹ P.A.R. 147.

² O'Dwyer 371-2.

³ So called from Lord Morley, Secretary of State for, and Lord Minto, Viceroy of, India.

⁴ So called from their only begetters, Mr. Montagu, Secretary of State for, and Lord Chelmsford, Viceroy of, India.

quent Presidents were elected by the Council itself. When the Governor wished to withhold his assent from a Bill passed by the Council he could return it for reconsideration either in whole or in part, together with any amendment which he might recommend, or he might reserve the Bill for the consideration of the Viceroy. Where a Governor's Legislative Council refused leave to introduce or failed to pass, in a form recommended by the Governor, any Bill dealing with a reserved subject, the Governor might certify that the passage of the Bill was essential for the discharge of his responsibility for the subject; after which the Governor's signature alone sufficed to convert the Bill into an Act of the provincial legislature. The Governor was then required to send an authentic copy of the enactment to the Viceroy who reserved the Act for the signification of His Majesty's pleasure and upon the signification of such assent by His Majesty in Council and the notification thereof by the Governor this Act has the same force and effect as an Act passed by the local legislature and duly assented to. No such Act could be presented for His Majesty's assent until it had been laid before Parliament for eight days.¹

Apart from its main function of legislation, the new Influence exercised by the Council over the Executive. Legislature played a very important part in influencing the Executive. Resolutions passed by the Council on any subject, reserved or transferred, though not binding on Government, carried weight as the expression of the will of the elected representatives of the people. The exercise by the Council members of their right to obtain information by means of questions both enlarged the Council's knowledge of the functions of the Executive, and brought to the notice of the Executive those aspects of the Administration which were arousing popular interest or criticism. Again, apart from the Statutory Committee on Public Accounts, twelve Standing Committees² each con-

¹ P.A.R. 148-50.

² On Finance, Canals, Jails, Industries, Co-operative Societies, Public Health, Agriculture, Education, Land Revenue, and Police.

taining a majority of elected members familiarised non-official members of Councils with the processes of administration. But the most effective way of making its influence felt upon the Council, lay in its control over finance.¹

The first Punjab Reforms Council was elected at the end of 1920 and met at the beginning of the First Reforms Council 1921. On the whole it represented the (1921-3). more moderate current of political opinion in the Province and was ready to approach racial questions in a friendly spirit. The residential qualification excluded the carpet-bagger from rural constituencies, which were represented mainly by landed proprietors of moderate means, in close touch with the needs of their constituencies. Cautious, and strongly imbued with the conservative ideas traditionally associated with the farmer class, it was some time before they realized how to work the complicated machinery of the Council. Urban members were for the most part lawyers, with a sprinkling of commercial men and retired officials. Muhammadans in the Council, led by the Minister Sir Fazl i-Husain, the only prominent party leader, were organized into a practically solid party of 35. Mainly representing rural constituencies, they formed also the bulk of a rural party, which allied itself with rural Hindus and Sikhs, when questions arose which affected rural, as opposed to urban interests. A proposal to facilitate the acquisition of land for industrial purposes was suspected by the rural members to foreshadow an attempt to repeal the Alienation of Land Act, the *Magna Charta* of the Punjab peasant, and was therefore rejected.

Still more solid was the party of the official members, always in constant attendance, and at the beck and call of the Executive Council. It had been one of Mr. Montague's most amiable intentions that official, no less than non-official, members of Council should give reality to its debates by expressing their true opinions on the questions under discussion. But the old secretariat Adam was not to be exercised by the good intentions of a distant Secretary of State; strong in its own self-righteousness it hated criticism,

¹ P.A.R. 151, p. 108.

and especially that informed criticism which only an official could give. Official members were therefore muzzled, except on special occasions when they were allowed to give a parrot-like exposition of the policy of Government; and this muzzling order was extended as far as possible to the non-official Government nominees. Many of them chafed bitterly at a system which reduced them to a row of Robots condemned to listen for long hours to speeches which kept them from their ordinary official duties, and which could make no difference to votes which were in any case hypothecated to Government.

The Second Reforms Council, elected in December 1923, contained a representation of the "Swaraj"¹ party, an element unknown to its predecessor. The party itself never secured a wide following in the Punjab, neither its organization nor its resources were equal to those attained in some other provinces, nor perhaps had it in a province of peasant proprietors with strong military traditions so easy a field for its enterprise as it found elsewhere. The presence in the Province of one or two prominent leaders of the Congress party was perhaps more responsible for any success attained by the Swaraj section at the polls than the strength of its propaganda or the force of its appeal to the people. These leaders undoubtedly exercised great influence over the lawyer and trading classes, and the combination represented rather a union of those who were opposed to the rural and agricultural interests than a genuine adherence to the tenets of the Congress programme. The Swaraj party in the Punjab might perhaps be described rather as urban and pro-Hindu than nationalist, its successes were mainly confined to urban electorates, where its opponents, who belonged to the "Moderate" party, had no defined platform. But while the "Swaraj" party in the Council maintained a policy generally antagonistic to Government proposals, it was not in itself sufficiently numerous and its inherent antipathy to the predominant

¹ Swaraj=Home Rule, the left wing of the Congress party.



rural *bloc* in the Council was such that it was unable to produce incidents similar to those which characterized the Central Assembly and some other provincial Legislatures.

The abolition of the residential qualification had offered a wider field of selection to rural constituencies, whose representatives were now both bolder and more united in pressing the claims of the rural classes on the Council. The raising of occupiers' rates on canal-irrigated lands seemed to provide the only obvious method of obtaining increased revenue. But the rural majority were not unnaturally reluctant to approve a form of taxation which would fall entirely on their own community. Even the Salt Tax, anathema to Congress politicians, seemed to them preferable, in that it would affect the urban as well as the rural consumer. The agricultural representative attached the highest importance to placing on a statutory basis the procedure for the assessment of land revenue. A Bill for this purpose had been framed by the Local Government, but was dropped in view of the unwillingness of the Government of India to endorse the proposals in the form in which they were framed. The occupiers' rates were raised by executive order, but the effect of this step, combined with the inability of the provincial Government to put forward a Land Revenue Bill, and the veto put on a Bill for the Registration of Money-lenders, was to put some strain on the allegiance of the rural party, on whose support the constant opposition of the Swaraj members compelled Government to rely.

It was at such moments that Government turned to its Ministers, for advice and assistance. From its gagged and fettered officials it could not hope for any help, and the whole business of lobbying, of propaganda, and of vote-catching fell on the Ministers. Two qualifications were therefore required in a Minister, an almost Secretariat servility to Government, combined with an apparent freedom from Government control. A Chief Secretary at heart, he must openly pose as a popular Tribune. Naturally men with such qualifications were not easy to find. When Ministers were first appointed, it was impossible to

Principles governing the appointment of Ministers.

WESTERN THEORIES AND EASTERN PRACTICE.

forecast the lines on which party feeling would range itself in the new Council. At the outset, the obvious and natural course was to select Ministers who would primarily represent the interests of the different communities. With the emergence of a rural *bloc* in the Council, capable at times of subordinating communal distinctions in a common programme, it was possible to consider in the selection of Ministers a principle more strictly in accord with constitutional requirements.

Ch. Lal Chand,¹ the successor of Lala Harkishan Lal, though a Hindu, came into the Council as a supporter of the programme of the agricultural party, and he and the Muhammadan Minister Sir Fazl-i-Hussain presented therefore a combination which could be said on most questions to represent the feelings of the predominant majority in the Council. Ch. Lal Chand was a man of strong character with administrative abilities acquired in work on the Rohtak District Board.² His district experience had taught him the administrative value of the English official, and he himself was inspired by a desire for the deliverance of the agriculturist (and particularly the Hindu agriculturist of the south-east) from the shackles of the money-lender. He had already laid the foundation of an active, though small rural Hindu party, when by the machinations of the money-lending Congress party a corruption case was concocted against him. Congress influence dominated the High Court, which nominated an urban Hindu to try the case, whose result, adverse to Ch. Lal Chand, was consequently a foregone conclusion. Ch. Lal Chand's Hindu successor, though an agriculturist, had neither his character nor his ability. Consequently after the election of the third Council in December, 1926, the Governor Sir Malcolm Hailey, decided to revert to the original practice, and an urban Hindu was substituted, his appointment marking a definite abandonment of the principles of party (or so-called constitutional) Government.³

¹ Ch. = Chaudri—originally denoted a minor local chief (See *L. F. R.*, 38, 180, 257) now a courtesy title for Jats of whom Ch. Lal Chand was one. See Appendix VII.

² I speak from my own experience, as Deputy Commissioner of the Rohtak District where I found Ch. Lal Chand's help invaluable.

³ *P.A.R.* 151-5; *P.A.R.* (1922-3) 23-40; *P.A.R.* (1923-4) 1-3; *P.A.R.* (1924-5) 110-12, 117.



CHAPTER II.

THE STATE AND THE LAND.

1.—LAND ADMINISTRATION.

Much food is in the tillage of the poor ;
But there is that is destroyed by reason of injustice.

Proverbs xiii. 23.

The most pressing problem facing the British on Land annexation was that of land revenue, which revenue. had from the earliest times constituted the only material item in the State revenue. The Hindu kings had taken a share of the produce of their demesne lands not generally exceeding a quarter, the actual amount being measured by the village accountants and collected in kind by the village headmen. A similar procedure was followed by their subordinate chiefs, in the lands delegated to them, in return for certain feudal services.

This procedure was adopted and systematised by the Muhammadan invaders, who, however, were less restrained in their demands from those whom they regarded as infidels. A radical modification was introduced with Akbar's cash assessment, under which the State took a lump sum from each holding instead of a share of the produce. But his system was too complicated. It necessitated the employment of a large staff of subordinate officials, who toured about measuring the cultivated land and " assessing " the cash sums payable. After Akbar's death these officials got out of control, the " assessments " were gradually abandoned, it being more satisfactory for all parties to agree to a lump-sum payable by the village and for which the headmen were responsible. As the Moghul Empire became more unwieldy in size and less efficient in administration, larger and larger areas were granted out to revenue farmers, who became responsible for the land revenue, which they themselves recovered from the villagers. The system lent itself to extortion, and on their arrival in Bengal the British found

THE STATE AND THE LAND

the land revenue practically equivalent to an economic rent. By the limitation of their demand the British created a transferable proprietary right in land vested in owners responsible for the land revenue. In Bengal and Oudh this ownership was generally conferred on the old Moghul revenue farmers or their successors, in Agra and the Punjab on the members of the joint village communities. In the Punjab the Sikhs had brought the Moghul Empire to an end, before a class of revenue farmers had time to arise. The Sikh administration was itself hostile to larger landowners. Where such had survived the British generally limited their claims to a percentage on the land revenue. Meantime "Settlement Officers" were appointed to decide on the amount of land revenue due on each parcel of land, and who in each case should be responsible for it. Cash assessments were fixed for terms of twenty or thirty years, after which reassessments were made. As a corollary to this, a valuable register of land titles was drawn up for all agricultural land throughout the Province and steps were gradually taken to keep it up to date.

In spite of the defects incidental to a fixed land revenue, which was rigorously collected every year whatever the character of the harvest, the British land revenue system was nevertheless an improvement on anything that had preceded it. The cultivator knew how much he had to pay, and he was secured against further exactions authorised or unauthorised.¹ The prevalence of the peasant proprietor became the main feature of the agricultural economy of the Province and the collection of land revenue from him in a country with a scanty and variable rainfall brought the administration into particularly close touch with the agricultural classes and agricultural problems.²

For the purpose of revenue management the Province is now divided into 29 districts, in charge of each of which is a Deputy Commissioner. These districts are grouped into five divisions each under a Commissioner. The Commissioner

Scheme of revenue administration.

¹ L.F.R. 347-8.

² A.C.M. 9.



exercises control over the revenue officers and revenue courts¹ of his division and is himself subject to the general control of the Financial Commissioner, who, under Government, is the head of the revenue administration. At the headquarters of each district are several executive officers of the Punjab Civil Service, who assist the Deputy Commissioner in his revenue and other duties, one of them, the Revenue Assistant, being chosen for his special aptitude for revenue work.

Each district is divided into three or four *tahsils*, in each of which there is a *tahsildar* with an assistant or *naib-tahsildar* to help him. In a few *tahsils* there are two *naib-tahsildars*, one of whom sometimes has special charge of an outlying portion of the *tahsil*, then known as a *sub-tahsil*. Similarly in some districts one or more outlying *tahsils* are formed into a sub-division and put in special charge of a resident Extra Assistant Commissioner called the Sub-Divisional Officer or S. D. O. (for short). Before the Reforms, Assistant Commissioners were often put in charge of sub-divisions, as it gave them an admirable opportunity of learning their work. Within his own sub-division such an officer performs all the duties usually entrusted to a Revenue Assistant.²

The unit of revenue administration is an estate,³ which is usually identical with a village.⁴ A *tahsil* as a rule contains from two to four hundred villages, from each of which the Deputy Commissioner collects land revenue. Each estate has a separate record of rights in land and a separate register of agricultural statistics. All its proprietors are still by law, though no longer in practice, jointly responsible for the payment of land revenue, and in their dealings with Government they are represented by one or more headmen,⁵ who receive as remuneration five per cent. on the land revenue of the village. The bond which unites the proprietary body is frequently a strong one, based on kinship; but in many parts of the Province it is, owing to historical accidents or physical peculiarities, of a very loose nature. In any case, however, the village system forms an essential part of the adminis-

¹ P. 170.

³ *Mahal*.

² L.A.M. 203, A.C.M. 9.

⁴ *Mauza*.

⁵ *Lambardar*.



tration, and to make it still more effective villages are grouped into circles or *zails* over each of which is appointed a *zaildar* from among the leading landowners. These *zaildars* receive their emoluments from Government, and form a very valuable unofficial agency connecting the administration with the agricultural classes. There is also an official chain connecting the village with the *tahsil*. The estates are grouped into small circles for each of which a village accountant¹ is appointed who is responsible for the maintenance of records and statistics. About twenty of these circles form the charge of a *qanungo* who supervises the village accountants and is himself responsible to the *tahsildar*.²

The duties of the *tahsildar* within his *tahsil* are *Tahsildars* and almost as manifold as those of the Deputy *naib-tahsildars*. Commissioner within his district. His magisterial work is important and he may, if discreetly guided, be very useful in preventing abuses in the working of the police. In all matters of administration he must be, within his own charge, the Deputy Commissioner's principal agent, and his power for good or evil is very great. His efficiency, more than that of any other officer in the district, except the Revenue Assistant, depends on his capacity for revenue work. No degree of excellence in other respects can atone for failure to properly direct and control the village accountants and *qanungos*, to collect the revenue punctually where the people are able to pay, and to point out promptly to the Deputy Commissioner any failure of crops or calamity of season, which renders suspensions or remissions of land revenue necessary.³ For purely land revenue purposes, *tahsils* are divided yearly between the *tahsildar* and the *naib-tahsildar*, though it is recognized that this division must not be allowed to detract from the *tahsildars*' general responsibility for the administration of his *tahsil* as a whole. The appointment of *tahsildars* and *naib-tahsildars* rests with the Financial Commissioner and the Commissioner,

¹ *Patwari*.

² *L.A.M.* 204, *A.C.M.* 9-10.

³ *L. A. M.* 241.

respectively, vacant posts being partly filled up by direct appointments and partly by promotion from the lower ranks. Honest and industrious village accountants have been known to rise to the rank of *tahsildars* and the possibility of such a rise is a great (if not the only) inducement to honesty and industry in the lower ranks of land revenue officials.

Possibilities of promotion to the Punjab Civil Service now form the chief attraction of the post of *tahsildar*, whose pay is now quite disproportionate to his importance and responsibilities.¹ During the War experience had shewn that the *tahsildar* was the one official who could get the things done ; and amongst the officials rewarded for their recruiting and other War activities, the *tahsildars* were specially conspicuous. To the mentality of the Reforms Government therefore the post seemed tainted with O'Dwyereanism, and *tahsildars* were specially excluded from the enhancements of pay which were lavished on the higher-paid officials generally at that time. Adhering too closely to the principle that "To him that hath shall more be given" that Government was prodigal in its gifts to the better-placed Indians, but did nothing for the underpaid intellectual proletariat. Even the village accountants only got their pay increased by threatening to go on strike and paralyse land administration throughout the Province. But their O'Dwyerian traditions kept the *tahsildars* in the path of loyalty to a Government, which rewarded loyalty in the manner customary with creatures of its kind.

The *tahsildar* can only be efficient if he is given a fairly free hand, and it is therefore necessary that his work should be periodically inspected to see that he is not abusing his trust. Every *tahsil* office should be thoroughly overhauled every six months. The Deputy Commissioner should himself inspect it at least once a year. If he cannot make the second inspection himself he should direct the Revenue Assistant or some other experienced Extra Assistant Commissioner, to make it for him. The scrutiny should include all branches of work :—Judicial

¹ L.A.M. 242-7 ; P.A.R. 264-7, p. 114.



(both civil and criminal) treasury, stamps, excise, Government loans to agriculturists, land revenue, and the *qanungo's* records. Special attention should be given to the examination of records of rights and agricultural statistics. The land revenue accounts should be examined to see whether they are regularly kept up, and whether the amounts due to Government are punctually realized and without any unnecessary resort to coercive processes. The causes of all outstanding balances should be traced. A perfunctory inspection is worse than useless; and, if time is limited, it is best to take up one or more branches of work and examine them thoroughly, and to leave the rest for a future occasion. Time for such inspections can often be best found in the hot weather, when ordinary work tends to be lighter owing to the departure of Government to the hills.¹

The general control of the revenue administration is exercised by the Revenue Financial Commissioner, whose multifarious Standing Orders represent the accumulated experience of two generations of able revenue officers. They have the great merit that they can be modified to meet the needs of experience without the need of a cumbrous legislative procedure. The Punjab land system as expounded in the Land Revenue and Tenancy Acts,² the rules under those Acts and the Financial Commissioner's Standing Orders can compare favourably with any in the world for cheapness and simplicity. It enables any purchaser of land to obtain, for a trifling sum, a complete history of the tenures of any piece of land from the time of the British occupation.³ Apart from his Standing Orders the Financial Commissioner gives special orders fixing the amounts and dates of the instalments by which land revenue is paid, and sanctioning the extreme steps necessary when land revenue cannot be recovered by the milder processes usually employed.⁴

The revenue powers of Commissioners are mainly confined to the exercise of general control, there being practically no particular matter which they can deal with on

¹ L.A.M. 236.

² P.A.R. 250.

³ See L.F.R. 254, 263, 266, 295.

⁴ L.A.M. 249.



their own initiative.¹ Most revenue proceedings are initiated by the Deputy Commissioner, the Revenue Assistant, the *tahsildar* or *naib-tahsildar*.² Such an officer may refer any case, which he is empowered to dispose of, to a subordinate revenue officer for investigation, and may decide the case on the report of the latter, though he should generally himself give the parties a hearing.³ Civil courts have no jurisdiction in respect of matters dealt with by revenue officers.⁴ On the other hand, any order which a Civil or Criminal Court issues for the attachment or sale of land or of the produce of land must be executed through the Deputy Commissioner or a revenue officer appointed by him for that purpose.⁵

Administrative control is exercised over all the revenue officers in a district by its Collector, in a division by its Commissioner, and in the whole province by the Financial Commissioner. Every controlling officer has authority to withdraw a case from any of his subordinate and either hear it himself or refer it for disposal to some other revenue officer under his control.⁶ Revenue officers of all grades possess large powers of reviewing their own orders and those of their predecessors, provided no appeal against them has been lodged.⁷ The law of appeal is very simple. Original orders passed by his subordinates are appealable to the Deputy Commissioner and original orders of the Deputy Commissioner to the Commissioner. An order confirmed on first appeal is final, and under no circumstances can there be more than a second appeal. The only cases which can come before the Financial Commissioner on appeal are those in which Commissioners have modified or reversed original orders passed by Deputy Commissioner.⁸

The primary duty of revenue officers is the collection of land revenue. There is nothing on which the happiness of subjects and the stability of governments more depends than the way in which revenue is assessed and

¹ L.A.M. 250.

² L.A.M. 251. For revenue purposes the Deputy Commissioner is known as a Collector, the Revenue Assistant as an Assistant Collector, 1st Grade, and a *Tahsildar* or *Naib-tahsildar* as Assistant Collector, 2nd Grade.

³ L.A.M. 252.

⁴ L.A.M. 253.

⁵ L.A.M. 254.

⁶ L.A.M. 259.

⁷ L.A.M. 260.

⁸ L.A.M. 262.

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collected. The old monarchy in France, which at one time had conferred great practical benefits on that country, was gradually undermined by its failure to limit the amount of its taxation, and to distribute it fairly over the different classes of the community. As a result it fell with a crash which shook the whole of Europe.¹ The income of early Indian rulers was always mainly derived from the share of the produce of the soil which the state claimed as its own; the collection of this share constituted the most important function of their administration and is still one of the chief duties of a Deputy Commissioner.² A sense of kinship with his people, or a fear of driving them to desperation sometimes inclined a ruler to moderation in land revenue collection; but severity was the general rule, and a governor who remitted his quota regularly to the King's treasury had little to fear from inquisitions into his methods of collection.³ It was easier to screw the revenue out of the peasantry by personal indignities or bodily torture than by the threat of depriving them of their lands, for if the cultivator was driven away there was generally no one to take his place.

When the East India Company became responsible for the government of Bengal and of the North-Western Provinces⁴ its regulations were dominated by the feeling that it was at once more logical and more humane to attach the land than to torture the person of one whose land revenue was in arrears. The power of confining defaulters was carefully guarded and limited, but the frequent sales of the land of defaulters led to the gradual expropriation of the old landowning classes. These evils had been laid bare and remedied before the annexation of the Punjab, when the collection of revenue, though still too rigid and mechanical, was never characterised by the harshness that prevailed in the valley of the Ganges.⁵

The land revenue of a holding, being a cash commutation of the right of Government to a share of the crops grown upon it, is properly declared to be the first charge upon the rents,

Present
methods of
collection.

¹ L.A.M. 497.

³ L.A.M. 499.

⁵ L.A.M. 500.

² L.A.M. 497.

⁴ Now the United Provinces (see p. 24.)

profits, and produce thereof. It is the Deputy Commissioner's business to safeguard this right. Without his consent no court can attach the rents, profits, or produce until the current land revenue and any arrears that may be due have been paid. Orders issued by Civil and Criminal courts for the attachment of land, or any interest in land or the produce of land, must, therefore, be addressed to and executed by, the Revenue Department.¹ It seemed at one time natural to enforce the Government lien on the produce by making the instalments of land revenue fall due before the crops from which they were to be liquidated were cut. But in practice this plan led to great abuses and was given up before the formal annexation² of the Punjab. Instalments are now arranged so as to become payable shortly after the garnering of the crops.³ It is the duty of the village headman to collect the revenue from the land-owners and pay it into the *tahsil* treasury. But if he can show that he has done his best and failed, his responsibility for an arrear is no greater than that of the other members of the brotherhood, and he should not be made their scapegoat.⁴

To aid the *tahsildar* in keeping an eye on the collection for each estate a separate village account of demand and receipts⁵ is kept up by the *tahsil* revenue accountants.⁶ As it is important that the *tahsildar* should be able to see at a glance the whole of what he has to realize from each estate, the demand is shown not only on account of land revenue, both fixed and fluctuating, but also on account of different items of miscellaneous grazing dues on State lands,⁷ process fees,⁸ local rates,⁹ canal water rates and so on. Under each item of demand is shown each receipt under that head with the date of payment.¹⁰ It is the duty of the village accountant after the autumn harvest inspection¹¹ is over to give the headman a list, showing the demand due under

¹ L.A.M. 501. ² i. e. under the Regency (L.F.R. 208.)

³ L.A.M. 502. ⁴ L.A.M. 505. ⁵ *Khatauni*.

⁶ *Wasil bagi nawis*. ⁷ *tirni*. ⁸ *talbana*.

⁹ The main source of income of the District Board, levied as a percentage on the land revenue and for practical purposes hardly distinguishable from it. ¹⁰ L.A.M. 507. ¹¹ *Kharif girdawari*.

different heads¹ from the owner of each holding.² This list is brought up to date and corrected, if necessary, after the spring harvest inspection.³ The village accountant is bound to explain the accounts to the headman, but he is forbidden to have anything to do with the actual collection of the money. He should give each headman for presentation at the *tahsil* a memorandum⁴ showing under the proper heads the amounts to be paid in.⁵ On his arrival at the *tahsil* the headman shows this memorandum to the revenue accountant.⁶ Having ascertained the proper distribution of the amount tendered, the revenue accountant enters it under the proper heads in the receipt register.⁷

A complicated ritual follows before the headman can get away with his receipt. As he is generally an ignorant rustic, while the *tahsil* establishment, being underpaid by Government, have to live mainly on their wits, he generally finds it simplifies matters to tip every one pretty freely, reserving a specially large *douceur* for the revenue accountant.⁸ The headman's experiences at the *tahsil* resemble, in practice, those of a visitor to an expensive hotel, of which the revenue accountant is the head porter. The experience is pleasing if he leaves a smiling well-tipped establishment behind him, but the exit of a poor man is troublesome and undignified. To obviate these difficulties, headmen are now given the alternative of paying their land revenue by postal money order, and in 1922-23 no less than 5 per cent. of the total land revenue⁹ was paid in this way. The system continues to grow in favour, particularly with headmen who reside at a distance from *tahsil* sub-treasuries and have only small sums to pay in, but those who have to pay in large sums still prefer to bring the money to the *tahsil* in person, partly because they have not complete confidence in the post, partly because it is cheaper to do so, and partly because by so doing the payer gets his receipt on the spot and goes

¹ i.e. land revenue, local rate etc.

² *fard dhal bachh*.

³ *Rabi girdawari*.

⁴ *arz irsal*.

⁵ L.A.M. 508.

⁶ *wasil bagi nawis*.

⁷ *dakhila bahi* L.A.M. 509.

⁸ *wasil bagi nawis*.

⁹ i.e. Rs. 27 lakhs out of 511 lakhs. (See p.

home satisfied, whereas otherwise he may have to wait for several days for the money order receipt. There has been some demand for the remission of money-order commission fees on land revenue payments and at the instance of the provincial Legislative Council the proposal was on two occasions fruitlessly brought to the notice of the Government of India. If the commission on revenue money-orders were remitted, almost the whole of the land revenue would be recovered through the post, thereby relieving the headmen, but at the expense of the Postal Department of the Government of India. Sanction has, however, been granted under certain conditions to the payment of land revenue by cheque on the Imperial Bank of India. This method of payment would be convenient if practicable, but very few headmen are in a position to take advantage of it.¹

The fact that the land revenue of the Province as a whole is a very light burden is proved by Coercive processes against defaulters the fact that this large sum of over four crores² is collected with the greatest ease. In 1921-22 out of 14,000 coercive processes issued about 7,600 were writs of demand.³ They amount to little more than a registered notice demanding payment of the kind frequently issued by creditors against debtors. Of the remaining 6,500 processes the great majority were warrants of arrest or distress warrants of which only 3,500 were actually executed, the majority of these being warrants of arrest.⁴ The burden of land revenue lies so lightly on the people that the severer legal processes, such as the distress and sale of the movable property of the defaulter, and the transfer, attachment, or sale of his land, are hardly ever resorted to.

The predecessors of the British generally took the Fixed and fluctuating assessments. land revenue in kind, in the form of an actual share of grain from the threshing floor. For this the British substituted a fixed cash demand. Painful experience alone taught them the secret

¹ P.A.R. (1923-4) 111. ² Appendix IV. ³ *dastak*.

⁴ P.A.R. (1922-3) 32.

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of assessing it with fairness and moderation. As a result the opportunities for oppression and speculation by underlings were much curtailed, the standard of living was raised, and the value of the proprietary right in the land was enormously enhanced.¹ It was the theory of those able officers who founded the revenue system of north-western India, that, if a moderate revenue of fixed amount was assessed, the landowners could meet the Government demand in bad seasons from the surplus of good years. The expectation was plausible, but it took too little account of two important factors, the Indian climate and the Indian people. It did not allow enough for the extreme vicissitudes of the harvest in many parts of the country and it assumed that habits of thriftlessness, the growth of many centuries of misrule, would disappear once there was a reasonable motive for saving.²

But the undue expansion of credit, which followed on the rapid growth of the value of land, in large measure nullified the effect of a fixed assessment as a school of thrift. Consequently, where the fluctuations in the crop areas from year to year were very extreme, it was in some cases judged best to give up a fixed demand altogether, and to adopt in its place an assessment varying with the acreage of crops harvested. These fluctuating assessments were originally confined to lands subjected to river inundation. They were then extended to the Canal Colonies of the Central Punjab, and to some of the desert tracts of the West, where a harvest is only reaped in the exceptional years of good rainfall. Thus the relative importance of this area has been steadily increasing till now nearly 40 per cent. of the total land revenue of the Province is fluctuating.³ Most of this is derived from areas formerly barren, which owing to the development of canal irrigation now yield golden harvests.⁴

¹ L.A.M. 544.

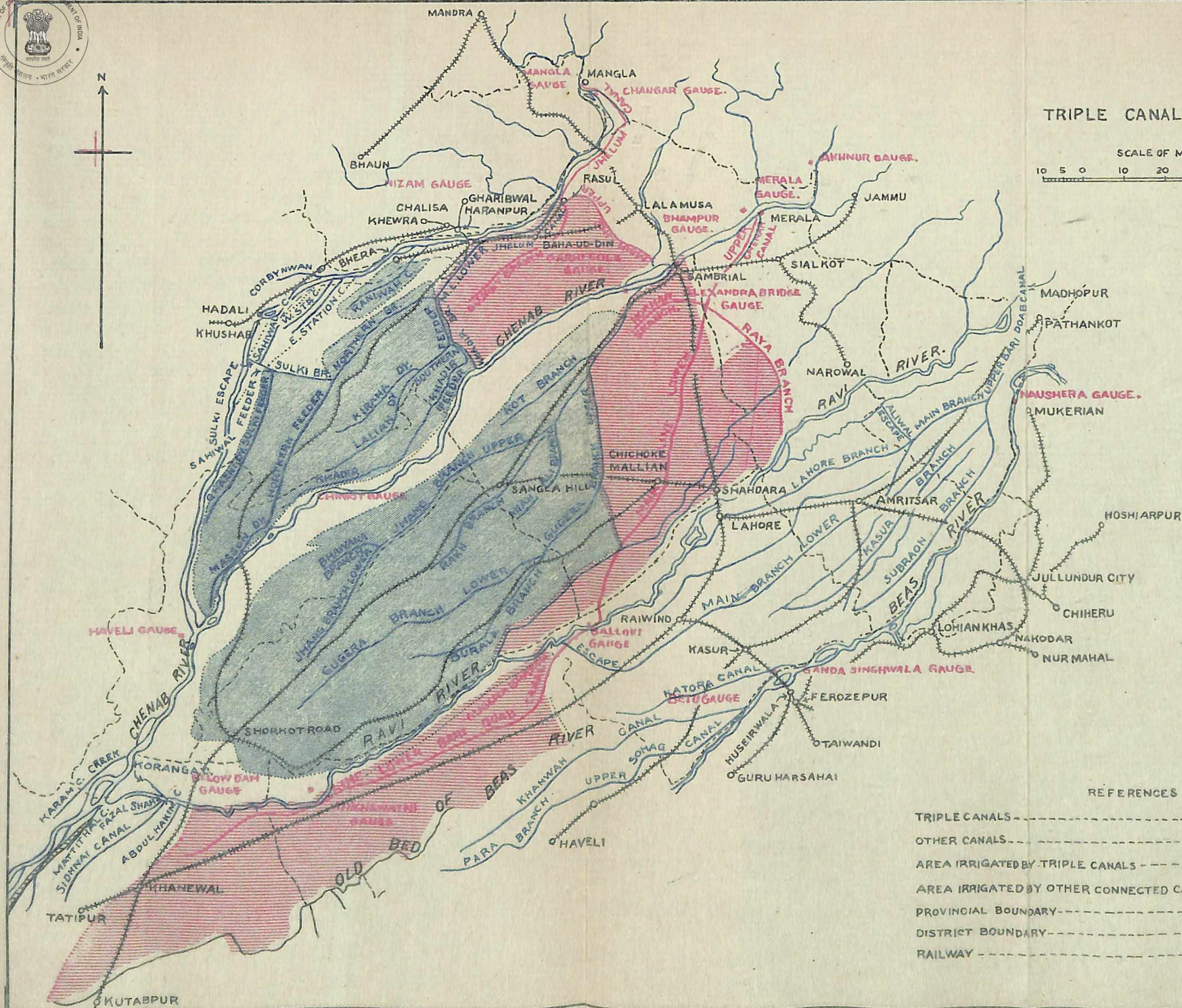
² L.A.M. 545.

³ In 1922-3 Rs. 200 lakhs out of a total of Rs. 511 lakhs.

⁴ L.A.M. 546 ; P.A.R. (1923-4) 110.

TRIPLE CANALS SYSTEM.

SCALE OF MILES
10 5 0 10 20 30 40 50



REFERENCES

- TRIPLE CANALS - - - - -
- OTHER CANALS - - - - -
- AREA IRRIGATED BY TRIPLE CANALS - - - - -
- AREA IRRIGATED BY OTHER CONNECTED CANALS - - - - -
- PROVINCIAL BOUNDARY - - - - -
- DISTRICT BOUNDARY - - - - -
- RAILWAY - - - - -

Suspensions
and remis-
sions of land
revenue.

Throughout the greater part of the Province the land revenue is, however, still fixed ; but the rigidity of this system is modified by the powers given to Deputy Commissioners of suspending¹ land revenue when the crops fail, or in serious cases remitting it altogether. The folly of collecting revenue from people, who by reason of severe drought have no food in their houses, and whose credit with the grain-dealer is well nigh exhausted, seems obvious, but in this matter routine has sometimes proved strong enough to overpower common sense.² On the other hand a fixed revenue demand must be treated as such, and it should only be suspended in villages where the Revenue Assistant has himself verified by a personal visit that such suspension is necessary.³

The vagaries of the rainfall are the most usual reasons for crop failure. Lack of rain at seed-time causes a shrinkage in the area sown, while shortage later prevents the growing crops from coming to maturity. In a very bad season it is but too common to find both these evils united to produce disaster. When rain fails at seed-time, the contraction of the area sown is of course most marked in unirrigated lands, but crops irrigated from wells are also affected. Their acreage is often reduced and the cost of raising them is much enhanced. If the land has to be watered before it can be sown, the effect of drought on the growing crops can hardly escape the most careless observer. But the mischief done by frequent heavy falls of rain to crops on light sandy soils is more likely to pass unnoticed.⁴ It is fortunate that those unirrigated tracts of the south-east of the province, in which suspensions on a large scale are most often required, are precisely those in which the recovery of arrears is most easy. There suspension should rarely be followed by remission, unless a succession of bad seasons entails very heavy losses of cattle and deprives the people of the means of rapidly replacing them. In these tracts the revenue rates have been pitched low and the holdings are as

¹ i.e., postponing its payment till the next harvest.

² L.A.M. 547. ³ L.A.M. 548, 550. ⁴ L.A.M. 552.

a rule large so that in good seasons the surplus after meeting all expenditure is very great.¹ The case of lands irrigated by wells is widely different. Such tracts can better stand a few bad seasons, but they suffer more seriously and recover more slowly from a severe drought prolonged over several harvests, especially when the holdings are small. In such cases remission rather than suspension of land revenue may prove the most satisfactory method of granting relief.² In a different category come the sudden hailstorms which ruin the wheat when it is being garnered, and the plague of locusts which devour every green thing. Such calamities are purely local in their incidence, but are ruinous where they occur; and call for the remission rather than the suspension of land revenue. The peasant has no means of recouping such losses, which are as likely to affect rich crops irrigated by a large outlay of money and labour as the cheap millets and pulses grown on rough tilled lands, of which the yield is normally insecure.³ In exceptional cases where a village has permanently deteriorated from waterlogging or some other cause a Deputy Commissioner may recommend the permanent reduction of the land revenue, but this should only be done in cases where he is satisfied that the deterioration is incurable and that judicious advances by Government⁴ for improvements will not enable the estate to recover its pristine prosperity.⁵

A complicated but effective machinery has been devised to prevent fraud and enforce punctuality in the collection of land revenue. All Land Revenue Accounts. revenue accounts are kept according to the agricultural year opening with the autumn,⁶ and closing with the spring⁷ harvest, and for the purpose of collection and balance statements this year is considered to begin on the 1st of October. In revenue accounts land revenue is classified as fixed, fluctuating, and miscellaneous. For account purposes fixed land revenue includes the income from Government lands leased for a term of years, though

¹ L.A.M. 556.

² L.A.M. 557.

³ L.A.M. 564.

⁴ *taqavi*.

⁵ L.A.M. 581-3.

⁶ *kharif*. ⁷ *rabi*.



technically what a tenant of the state pays for such land is rent, and not land revenue. But it is important to bring on the fixed land revenue roll all items which do not vary from year to year, in order that their realization may be subject to a strict check. As a matter of convenience rents of Government lands generally take the form of a land revenue assessment with the addition of a proprietary fee. The term miscellaneous land revenue is applied to receipts of various kinds, some of which are not connected with the land at all. An important item under this head is the income from fees levied for grazing in the vast tracts of Government waste lands, which are so marked a feature of some of the south-western districts.¹

To ensure the regular collection of the revenue it is essential to have an accurate land revenue roll² drawn up yearly. Additions to the roll are chiefly caused by progressive assessments, lapse of assignments³ and alluvion,⁴ and deductions from it by the grant of assignments,⁵ diluvion,⁶ and the taking up of land for public purposes. Such a roll is drawn up for each tahsil by the tahsil revenue accountant,⁷ who submits it through the *tahsildar* to the district revenue accountant, who checks it, gets it countersigned by the Deputy Commissioner, and returned to the *tahsildar* before the 1st October. A district abstract is at the same time forwarded to through the Commissioner to the Financial Commissioner. The progress of collection is checked by the Deputy Commissioner and the district revenue accountant through the monthly collection statement⁸ submitted by the *tahsildar*. This shews the progress made in the realization of the land revenue, fixed fluctuating and miscellaneous, and the balances remaining for recovery.⁹

An important class of cases dealt with by revenue officers relate to the partition of land. From time immemorial the proprietary body of the village community possessed part of its lands in common.

¹ *timri*. ² *qistbandi*. ³ *jagir*.
⁴ i.e., land formed by river action.
⁵ i.e., land washed away by river action.
⁶ *wasil bagi navis*. ⁷ *Sadar wasil bagi navis*.
⁸ *tauzih*. ⁹ L.A.M. 584—609.

The village site, the grazing lands over which the cattle wandered, and sometimes the wells from which the people drew their drinking water, were held in joint ownership. Often each sub-division¹ of the village had also its own common land in addition to its share in the common land² of the whole community.³ But, besides the large joint holdings in which all the landowners have an interest, it constantly happens that many of the other holdings are jointly owned by several shareholders. According to native ideas land in north-western India, at least wherever real village communities exist, belongs rather to the family than to the individual. What may be called family holdings were very common when the first British records-of-rights were framed. But the tendency of the English legal system has been to substitute individual for communal holdings. Holdings of the latter type are, however, still numerous; and holdings owned by individuals are constantly reverting to the condition of joint holdings under the law of inheritance which gives to each son, or failing sons to each male collateral in the same degree of relationship, an equal share in the land of a deceased proprietor.⁴ The increase of population and of the profits derived from agriculture leads in time to large portions of the common waste being broken up by individual shareholders, with the result that in the end a demand arises for its partition. Family quarrels and the restraints and inconveniences which spring from common ownership constantly make those who are interested in other joint holdings anxious to divide the land.⁵ Private partitions are frequently made, but there is always a risk that some shareholder will become dissatisfied and allege that the division was only one for convenience of cultivation and was not intended to be of a permanent character. Landowners therefore usually apply to the revenue authorities to make the partition for them, and this is especially the case when the area held in common is large and the shareholders numerous.⁶

¹ *taraf, patti or pana.*

² *shamilat.*

³ *L.A.M. 447.*

⁴ *L.A.M. 448.*

⁵ *L.A.M. 449.*

⁶ *L.A.M. 451.*



Partition cases are generally decided by the Revenue Assistant. In the case of a village objections to site, which is hardly ever assessed to land Partition.

revenue except in the Canal Colonies, he *must* refuse partition, as lands so unassessed can only be dealt with by a Civil Court. Even if it is so assessed, he *may* refuse partition, and this discretionary power may properly be held to extend to the uncultivated land round a village, which is used as standing ground for cattle, or occupied by enclosures for fodder and manure. Places of worship and burial grounds cannot be partitioned, unless the parties record and file an agreement assenting to their division. In arid tracts, where the people depend on tanks for their own drinking water and for the watering of their cattle, it may be a matter of importance to keep the waste area which feeds a tank free from cultivation, though the land hunger is now so great that many of the owners may clamour to have it divided. Again where pasture is scarce or likely to become so, especially where a supply of fodder crops is not assured by abundant artificial irrigation, part of the village common may be set aside as a grazing ground and excluded from partition.

In other cases the Revenue Assistant should normally refer the case to the *tahsildar* or *naib-tahsildar* for report. When the partition is contested, the reporting officer should visit the spot, in order to ascertain the local peculiarities of the land to be partitioned.¹ He may then find himself confronted at the outset by a denial of the correctness of the record of rights or some other objection to the title in the land of the applicant for partition. In such cases all that the *tahsildar* can do is to record clearly what the points at issue are and return the case to the Revenue Assistant. To prevent undue delays the Revenue Assistant is granted the power of a Civil Court to decide such a question of title, and he should exercise this power, unless he is of opinion that the party asking for partition has done so in order to evade direct resort to the Civil Court regarding a question of title which he knows to be disputed.

¹ L.A.M. 230, 453, 456.

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A widow's application for partition is often strongly opposed by the other co-sharers. Among agricultural tribes in the Punjab a widow who has no sons inherits as a rule only a life interest in her deceased husband's land. Her right is indisputable, but it is one that is viewed with great jealousy by the ultimate heirs. Where her property consists of a share in a joint holding they are very loth to allow her separate possession, from a fear, often well founded, that she will manage it badly and probably in the end attempt to alienate it. But while the holding remains undivided the widow often finds it difficult to obtain her fair share of the produce. If, however, satisfactory arrangements can be made to secure for her the due enjoyment of her life interest without partition, it should be disallowed.¹

Such objections having been disposed of, the next thing is to determine the method of partition. This involves dividing the land into classes, an equal proportion of which will go to each shareholder. Where an exact application of the rule of equal proportions would result in the formation of an excessive number of small scattered plots or fields, it should be pointed out that division on these lines has many disadvantages from the point of view of agricultural efficiency. It entails waste of the cultivator's time and labour and adds to the work of his bullocks by multiplying journeys to and from his land. It causes waste of water and even water-logging by involving the use of unnecessarily long, tortuous or badly aligned water-courses from wells or canals. It makes the sinking of wells, the drainage or levelling of the land and other agricultural improvements more difficult, while small fields may often be an obstacle to the employment of improved agricultural implements and machinery. Should the Revenue Officer fail to convince the parties of the disadvantage of the excessive fragmentation caused by a strict application of the rule of equal proportions he may nevertheless authorize duly specified deviations from it. Moreover, it is not always

¹ L.A.M. 457.



equitable to give each man his exact share of each class of land. While the holding was joint one shareholder may have brought part of it under irrigation by sinking a well or digging an irrigation channel, or may have raised its value by embanking it. He ought, as far as possible, to be allowed to retain the land whose present value is due to his enterprise.¹ These and other similar considerations determine the method of partition, and it is only when this has been determined that the Revenue Officer may proceed to carry out the actual partition of the land in accordance with that method.

The decline in administrative efficiency which characterised the post-War epoch was nowhere more evident than in the conduct of partition cases. Scandalous delays were allowed to occur, the plea of a disputed title being readily admitted by lazy Revenue Assistants as an excuse for sending the parties to the Civil Courts. No proper care was taken to lay down clearly the method of partition or to define accurately the limit of the land assigned to each shareholder, or to point these out on the spot to the parties interested. Many of these partitions were purely on paper, in no way agreeing with the existing facts of possession, and thus containing the seeds of future litigation, often resulting in murderous riots. The main cause of all this trouble lay in the increasing disinclinations of harassed *tahsildars* to visit the village² where the land was situated, and explain the proposed method of partition to the people; nor did the orders passed by Revenue Assistants enter into sufficient detail to enable the actual partition to be carried out without any further dispute.³

¹ L.A.M. 459.

² A disinclination which was partly also due to the unwise fixing of the travelling allowance of *tahsildars*, and *naib tahsildars*, so that they got the same allowance whether they travelled or not. This action (so characteristic of the Reforms epoch) was taken purely to save the Finance Department trouble in preparing its Budget, with utter indifference to the consequent demoralisation of land revenue administration.

³ L.A.M. 457; P.A.R. (1922-23) 37.

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The revenue staff is the agency used when land is required for public purposes, either for a Government department or a public Company. Though compulsory acquisition costs the acquiring department 15 per cent. more than the market price of the land, it is generally preferable to acquisition by private negotiation, which always involves the risk of extravagant valuation.¹ The first step to be taken is the preparation of a proper plan of the land by an officer of the department which wishes to acquire it. Having made his plan he must obtain from the Deputy Commissioner data for a preliminary estimate of the cost of acquiring the land. All that the Deputy Commissioner is expected to give at this stage is the ordinary rate per acre which land of that description fetches in the neighbourhood, and a rough valuation of the trees and buildings on the land.² Should this preliminary estimate appear to the department to justify it, Government will issue a notification directing the Deputy Commissioner (or a special officer invested with the necessary powers) to take order for the acquisition.³ The land is then marked out and measured through the *tahsildar*,⁴ who will furnish to the Deputy Commissioner a detailed report of the land to be acquired by fields, shewing for each field the class of the land, the owner and the land revenue he pays and the rent he receives, together with the trees, crops, wells, and buildings on it and their estimated value. His report will also give the chief data from which the market value of the land can be deduced, and his own opinion as to its proper price.⁵ The Deputy Commissioner's award of compensation to the owners will be based on the *tahsildar's* report, due consideration being also given to the representation both of the owners and the Government department.⁶

When the land to be acquired is for a railway or canal, it may lessen the value of some other land of the owners. A canal, for example, may so divide up a village area, as to compel a cultivator to take his plough oxen round a

¹ L.A.M. 464.

² L.A.M. 465.

³ L.A.M. 467.

⁴ L.A.M. 469.

⁵ L.A.M. 471.

⁶ L.A.M. 472-6.

Damage to
unacquired
land.

detour of three or four miles before he can cultivate fields only a few hundred yards off. It is not always feasible to build another village¹ across the canal. The land may all be cultivated, or none of it may be common property. "No wise man will do anything to justify the idea that the administration works with the unsympathetic rigour of a piece of machinery."² In acquiring land for railways, therefore, the fullest consideration should be given to the convenience of the landowners, slight alterations in the alignment being made, wherever this is feasible, if annoyance to the people can be thereby obviated. It is for this reason that the Irrigation Department may only construct a watercourse though land irrigated by a well when a suitable pipe, culvert or syphon conveying the well-owner's water across the Irrigation watercourse has been completed at Government expense. This principle applies equally to other public works; and a Deputy Commissioner is quite justified in asking the departmental officer whether a modification of the alignment, which would be convenient to the proprietors, would diminish the usefulness or seriously increase the cost of the work. A sympathetic consideration for the convenience of the proprietors also minimizes the chance of those claims for consequential damages, which are exceedingly difficult to deal with equitably.³

For the purpose of awarding compensation, the Award of value of the land at the time the notification compensation. was issued must alone be taken into account. The urgency of the need Government has to get the land, and the reluctance of the owner to part with it, have nothing to do with the question. The fact that the use to which the land is to be put will increase the value of other land belonging to the owner is also quite immaterial.⁴ These complications can be avoided if the expropriated proprietors are given Government land as compensation, and where this is possible this solution is

¹ i.e., a village site (*abadi*) as distinguished from a village territory (*mauza*).

² L.A.M. 478. So saith Sir James Douie (1908). But the wisdom of a later age thinks only of the Government machine, and not at all of the unfortunates who are cut to pieces by it.

³ L.A.M. 478.

⁴ L.A.M. 479.

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generally more satisfactory to both parties.¹ Where a money award is made by the Deputy Commissioner, owners objecting to it may require him to refer their objections for decision to the Civil Court,² and in such cases the Deputy Commissioner must inform the departmental officer and must supply him with a copy of the owner's application stating the ground on which he objects to the award.³ Where land in the permanent occupation of any department is no longer required it should be handed over to the Deputy Commissioner of the district, who becomes responsible for its disposal. There is no legal bar to its being put up to auction. But as a matter of grace Government is usually willing to restore agricultural and pastoral land to the legal representatives of the persons from whom it was originally acquired, on their refunding the amount paid as compensation less the 15 per cent. granted for compulsory acquisition.⁴

In certain cases, of which the most important are Revenue those between landlords and tenants, a revenue officer has to follow the more lengthy procedure of the civil courts and he is for that purpose known as a revenue court. The distinction between revenue and civil courts is one of agency not of procedure. It is well that land cases should be tried by officers whose daily work brings them into close contact with the rural population, because the special experience so acquired conduces to a readier appreciation of the points at issue, and greater skill in obtaining and appraising the value of the evidence.⁵ The idea that revenue litigation is less regular and more subject to the idiosyncracies of the judge than civil litigation is quite erroneous. At one time the jurisdiction of revenue courts embraced all suits for landed property, but now questions of title are decided by the civil courts, whose lack of practical experience with land administration and lack of knowledge of the technicalities of land records renders their adjudication of such questions far from satisfactory.⁶

¹ L.A.M. 480.

² L.A.M. 483.

³ L.A.M. 486.

⁴ L.A.M. 483.

⁵ L.A.M. 790.

⁶ L.A.M. 789-93.



The procedure of revenue courts is governed by the Code of Civil Procedure. The suit is opened by the presentation of a plaint,¹ on the back of which must be endorsed the name of the presenter and the date of presentation.

If the plaint is in the proper form, duly stamped, signed and verified, and is not for any reason rejected *in limine* or returned to the presenter for amendment, the court will give an order for the issue of summons on the defendant. A date is then fixed for the preliminary hearing and the plaintiff directed to deposit process fees, if he has not already done so.

The first hearing is either for the settlement of the points at issue, or for final disposal of the suit.² When all the parties are in court the presiding officer takes down the defendant's written reply³ to the plaint. He should then note whether the material allegations of fact made by the plaintiff are admitted or denied in the reply, and whether the defendant has made any further statements which the plaintiff must be called on to admit or deny. He should next examine the parties on oath and find out the points at issue before them. When this has been done and the court has before it the plaint, pleas, written statements, admissions and denials of the parties, it will be in a position to frame issues upon the points in dispute. Each point at issue should be in the form of a single question and never be in alternative form; each will contain a question of law or of fact, which one party avers and the other denies. It is most important to draw up the points at issue correctly, and the whole difficulty of a suit is generally over once they have been properly framed. After discovering the points at issue, the officer must ask himself, concerning each point, which party would fail were no evidence to be given on either side? The answers to these questions show the parties on whom the burden of proving each point at issue lies. A

date is then fixed for the hearing of the evidence, the parties being directed to put in all documents on which they rely. This is most important, as the witnesses produced are nearly always bribed or prejudiced, and the case should normally be decided on the documentary evidence alone.

Having heard the witnesses and the arguments of the pleaders, the judgment should then be written and pronounced. The lazy custom of reserving judgment is only justifiable when some technical legal point is raised, which requires research into works of reference not immediately available. Otherwise delay only means postponing the difficulty of writing the judgment to a time when the circumstances of the case are forgotten. The judgment must contain—(1) a concise statement of the allegations of the parties, as shown by the abstracts of the case made when they first appeared and by their statements then recorded; (2) the points at issue; (3) a brief summary of the evidence regarding each point at issue; (4) the finding thereon, with reasons; (5) the decree. It must be dated and signed in full by the presiding officer.¹ The cases both of revenue officers and of revenue courts should be dealt with as far as possible near the spot; when that is impossible they should be conducted at the district headquarters rather than at some place in camp more difficult for the parties to get at.²

An important class of suits heard by revenue courts deals with the relations between landlords and those quasi-proprietors known as occupancy tenants,³ whose rights can only be established and whose rent can only be enhanced by a decree of a revenue court.⁴ Such tenants can only be ejected if they fail to cultivate the land in the manner or to the extent customary in the locality.⁵ A tenant-at-will is entitled to compensation for any improvements he may have made to the land from which he is ejected.⁶ Suits

¹ Buck 59-63.

² L.A.R. 230; P.A.R. (1924-25) 127.

³ See L.F.R. 163, 174, note 7, 192, 252-5. ⁴ L.A.M. 796-800.

⁵ L.A.M. 802.

⁶ L.A.M. 804.



for arrears of rent involve the question as to whether rent has or has not been paid and in the latter case determining the amount which should be decreed. Seeing that in the majority of cases rent is paid in kind this involves a valuation of crops of uncertain yield and whose price varies extremely from year to year. The area under each crop grown in the harvest for which rent is claimed can be taken from the harvest inspections,¹ failed crops being of course left out of account. The remaining steps of the calculation are the same as those taken by a Settlement Officer when he is framing his net assets estimate.²

The strong body of Government servants, of which Value of un- the Deputy Commissioner is the head to a official agency powerful piece of administrative machinery; administra- but, as links between the higher officers and the tion. communities for whose welfare they are responsible, its inferior members have the defects which belong to purely official agency.³ The village system of North Western India, properly organized and wisely worked, is also a powerful engine of administration. To make it still more effective clusters of villages, which are united by the bond of tribal or historical association, or of common interests, are usually formed into circles or *zails*, over each of which is appointed a *zaildar* chosen by the Deputy Commissioner from among the leading village headmen. The *zaildars* receive their emolument from Government, while the headmen are paid by the communities which they represent. Together they form a very valuable unofficial agency, through which the Deputy Commissioner and the *tahsildar* convey the wishes of Government to the people and secure the carrying out of their own orders.⁴

It is obviously convenient for the State to deal Village head- with bodies like village communities through men. headmen. The internal affairs of such communities used to be, and in the south-east of the Province

¹ *Khasra girdawari*, see *L.F.R.* 273.

² *L.A.M.* 807, see *L.F.R.* 263.

³ *L.A.M.* 305. ⁴ *L.A.M.* 204.

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 still in a measure are managed by Committees of Elders.¹ But under British rule these fell into decay,² their functions devolving on the village headmen who thereafter acted on behalf of the landowners, tenants, and other village residents in their relations with the State. Representing, as they do, the village community, the village headmen must be chosen from among the landowners of the village. They are bound to attend when summoned by officers of Government and to aid them in the execution of their public duties. They have also important functions as regards the prevention and detection of crime.³ They are remunerated by a surcharge of 5 per cent. on the land revenue actually collected.⁴

Headmen were generally appointed originally at the first regular British land revenue settlement. To prevent heart-burning most of the members of the old village Committees of Elders⁵ were appointed headmen and in fixing the number of posts too much attention was paid to the interests of individuals and too little to those of the administration. The result is that in many villages the number of headmen is too large. Authority is so much divided that no headman is really influential and not a few have become too poor to be proper representatives of the other landowners.⁶ The appointment is for life⁷; but, when a headman becomes too old to act or is otherwise unable to perform his duties himself, a substitute may be appointed, who must receive at least one half of the headman's remuneration.⁸ The post is generally hereditary; but where there are no near collaterals the necessity of regarding hereditary claims disappears;⁹ and in such cases, as also in the case of a headman dismissed for poverty, crime, or persistent neglect of duty,¹⁰ opportunity may be taken to appoint no successor if the number of headmen is already too large.¹¹

New appointments to the office of headman have therefore seldom to be made now, except in newly settled Canal Colonies, where the Colonization Officer is in a position to select picked

¹ *panchayat* pp. 4, 13.

³ *L.A.M.* 307, 310.

⁵ *panchayat*, see p. 4.

⁷ *L.A.M.* 314.

⁹ *L.A.M.* 324.

² *L.A.M.* 306, p. 13.

⁴ *L.A.M.* 308.

⁶ *L.A.M.* 311.

⁸ *L.A.M.* 315-16.

¹⁰ *L.A.M.* 319. ¹¹ *C.M.* 330.

men as the first headmen of a new village. He should make full use of his opportunity, since subsequent appointments, as in settled districts, are decided chiefly on the hereditary principle. Such appointments should be confined to literate, energetic, helpful men of good character who are unburdened by debt, and have brought with them from their old home influence over a considerable number of fellow-colonists.¹ There is generally no difficulty in securing such men, the post being particularly attractive in the Canal Colonies as it often carries with it an extra grant of land in addition to the usual percentage on the land revenue.²

At the head of the unofficial administrative agency of a district come the *zaildars*, who are *Zaildars*. ordinarily (though not necessarily) chosen from among the headmen of their *zail*. The post is one of great responsibility and therefore in making new appointments hereditary claims are not, as in the case of village headmen, the chief consideration. Capable *zaildars* afford the Deputy Commissioner a ready means of getting in touch with the people and ascertaining their views on current questions. He will find many branches of revenue and administrative work in which he can utilize their services, and above all he has in them a powerful engine for the prevention and detection of crime. Like village headmen they are bound to aid in all sorts of revenue work, and to report when Government buildings, roads, or boundary marks are out of repair. When called on to do so they notify throughout their *zails* all Government orders, and use their personal influence to secure prompt compliance with them. While abstaining from personal interference with the work of village headmen and accountants, it is their duty to see that it is properly performed and to inform the authorities of any failure in this respect. Forbidden to intermeddle of their own motion with cases pending in the law courts, they can sometimes be employed with advantage as conciliators, or in making preliminary enquiries into petty criminal complaints, which are generally the

¹ C.M. 455.

² C.M. 453.

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exaggerated reflections of trivial village or family quarrels. In fixing *zail* boundaries administrative convenience is the first consideration, but where a small strong tribe inhabit a compact cluster of villages, such villages may be formed into a separate *zail*, even though the result should be a *zail* of specially small size.

Zaildars are remunerated by a deduction of one per cent. of the land revenue. This deduction used to be generally made from the land revenue of their own *zail*. A better plan which is now more usually followed is to have the remunerations arranged in different grades, the total amount being equal to one per cent. of the land revenue of the *tahsil* or district. The grade system secures a fairer distribution when *zaildars* are first appointed, for it by no means follows that the *zail* which yields the biggest revenue is either the largest in area or the most troublesome to manage. Above all it enables the Deputy Commissioner to recognize good work by promoting deserving men on the occurrence of vacancies, and now and then to punish slackness by reducing a *zaildar* to an inferior grade. Such promotions or reductions mean much more to the *zaildar* than the trivial sum of money involved, the salaries of *zaildars* hardly re-imbursing them for the expenses involved in the performance of their duties and the post being valued as bringing honour rather than emolument. In many *zails*, the *zaildar* has an assistant,¹ whose emoluments are much smaller, and whose duties are confined to helping the *zaildar*, no definite group of villages being put under his charge.²

An interesting part of a Deputy Commissioner's duties concerns his management of estates under the Court of Wards, which in the Punjab is only the Financial Commissioner under another name, though in practice, he delegates many of his powers to Commissioners and Deputy Commissioners.³ The institution of a Court of Wards to take care of the persons and property of people of good social position, who,

¹ Known as *Sufedposh*—Clad in white, apparently on the *lucus a non lucendo* principle, their clothes being seldom white and generally far from clean. ² *L.A.M.* 334—8; *S.M.* 578—82. ³ *P.A.R.* (1923-4) 138.



owing to minority, sex, mental incapacity, or for other reasons, are unfit to manage their own affairs, is an act at once of charity and of policy. In the case of children, of women, and persons of unsound mind the former motive would suffice. An untimely death is the natural end of the self-indulgent lives led by too many men of good family in the Punjab. Having lived just long enough to load their patrimony with debt, they hand it on heavily encumbered to young widows or helpless children. Capacity for business is no more confined to one sex in India than elsewhere. But the secluded life led by women of rank, and the influences to which they are exposed after the death of their husbands, generally make them unfit to manage with success family property either on their own behalf or on that of their minor sons.

The intervention of the Court of Wards is, however, only necessary in the case of families of some importance. The Guardian and Wards Act,¹ provides sufficiently for others. Where no other suitable guardian can be found it allows the District Judge to appoint the Deputy Commissioner to fill that office. When, however, a family of social importance is engaged in trade or in any occupation which a Government official cannot carry on, it will rarely be of advantage to the minor to be brought under the Court of Wards. The considerations which lead the State to interfere in the case of landholders of vicious or spendthrift habits are almost wholly political. The law does not contemplate the putting of any restraint on a man's power of dissipating his property by vicious courses or the extravagant pursuit of pleasure, unless he belongs to a family whose political or social importance it is a matter of public interest to preserve. In this respect it does not go as far as the French law, which permits the relations of any prodigal spendthrift to apply for the appointment of a judicial adviser without whose "assistance" he is powerless to borrow

¹ Act VIII of 1890.

money, to sell or mortgage his immovable property or to bring a suit in court. ¹

The charge of a ward's property is entrusted to a manager, who should generally be a Government servant. He should prevent the accumulation of large cash balances or of securities readily convertible into cash, which merely provide a temptation to a ward to squander such easily realisable assets, as soon as he is released from the control of the Court. The first and most desirable form of investment is the improvement of the ward's own estate by the digging of wells or tanks, the making of embankments or drains, and whatever will increase the value of the land, the security of the crops and the prosperity of the tenantry. The treatment of the tenants in an estate managed by the Court of Wards should be an example to neighbouring landowners. Undue enhancement of rents must be avoided. There is often more than a mere business relation between landowner and cultivator—as is testified to by the favourable rents which tenants not unfrequently enjoy—and it is inexpedient to reduce all to a uniform level and to abolish privileges which the proprietor himself would wish to preserve. A rate is levied on the income of estates managed by the Court of Wards, the proceeds from which are intended to cover the cost of all ordinary Government establishments in so far as these have to devote part of their time to Court of Wards business. This of course does not include any staff recruited solely for the management of a particular estate. Such a staff is paid out of the income of the estate or which employs it.

Where a ward is insane, or is a minor or an unmarried female, or suffers from some physical or mental infirmity, a guardian is generally appointed. The education of wards of good family has always been a difficult problem. There can be no question in these days as to the kind of knowledge to be imparted. Men of family, if they are to maintain their

¹ (The power which reversioners possess under the Customary Law of the Punjab to sue for cancellation of the transfer of land made without necessity is a restraint of the same kind) L.A.M. 672-3.



position, must share in that familiarity with Western ideas and modes of thought, which is becoming the common property of all Indians. But a young Indian leaving conservative home surroundings to receive such an education is very much in the position of a young Englishman in the sixteenth century faring to Rome or Padua to reap the fruits of the Renaissance,¹ and the results are often equally disappointing. Yet the risks of home education are greater and though a boy's relatives commonly urge its advantages, there can in most cases be no doubt that their wishes should be overruled. At best the Eastern home of a fatherless boy of good position and large means is not a school for the development of the manly virtues; at worst it means an entourage of women trying to seduce him in the *zenana*, and of flatterers offering to pimp for him outside. As far as possible, therefore, every ward who is of suitable age, rank, and wealth, should be sent to the Chief's College at Lahore, other wards being sent to a Government School. Private tuition is not often desirable, as a private tutor often degenerates into a *pandar*, but the weak health of a ward or other circumstances sometimes leave no choice in the matter.²

2. LAND RECORDS.

Remove not the ancient landmarks,
Which thy fathers have set.

Proverbs xxii. 28.

In early times rights in land were generally only recorded with a view to more effective taxation by the ruling power. William the Conqueror's Domesday Book was the best as well as the first record of rights in land in England. More recently attention has been drawn to the economic rather than the financial aspect of such a record of titles. In 1924 the English Agricultural Tribunal of Investigation recognized that a simple system of Land Registration was

Land Regis-
tration re-
cords.

¹ *Inglese Italianato ed iavolo incarnato.*

² *L.A.M.* 693, 696.



a sine qua non of rural economic progress. Such systems may be classified under two heads, according as they provide for registration of deeds or registration of title. The former is favoured in most European countries, the latter in the British Dominions. In Australia, New Zealand and parts of Canada and the United States a certificate of registration constitutes conclusive evidence of title. In England registration of title is only compulsory in the County of London, but the Agricultural Tribunal recommended its general adoption on economic grounds.¹ In India a record of rights in land arose as a by-product of the land revenue system. This necessitated the preparation of a very elaborate cadastral record of each estate showing not only the persons who were liable to pay, but also the amount for which each person was primarily responsible. This record of rights,² a sort of modern Domesday Book, became the basis of a system of land records. These land records give a complete survey of all rights in land. Though originally drawn up mainly with the object of providing a basis for the land revenue assessment, this record of past and present rights in land performs a valuable public service for the most part unobtainable in other countries.

For the purpose of assessing land revenue the whole area of the Punjab is divided up into estates, each usually identical with a village, for the revenue of each of which the recorded proprietors are theoretically jointly and severally responsible. Under the Sikhs cash assessments were known, but it was more usual for the State to take a share of the produce—a system which had the advantage of tempering the wind to the shorn lamb. The British system of fixed cash assessments proceeded on the assumption that the peasant would be able to save enough in a good year to meet the losses of a bad year—an assumption which was not warranted by the facts. The original summary fixed assessments of the Province were for this reason in many cases found to be too high and had to be reduced subsequently when more

¹ A.T.I. 93—101, 256.

² *jamabandi*.

regular settlements were made. Ultimately, the State's share of the produce, which had in Sikh times approximated to the net assets, or the economic rent which could be extracted by a rack-renting landlord, was reduced to a maximum of one-half, which in practice seldom exceeded one-third and was often less than a quarter, of that amount. About 1870 land revenue procedure was put on a legal footing by the first Land Revenue and Tenancy Acts. At that time land records were only revised when a district came under a Settlement¹ (i.e., a revision of the land revenue assessment). But with the reforms introduced by Col. Wace in 1887 a more continuous supervision was ensured by the appointment of field *qanungos*² to supervise the work of the village accountants³ who were primarily responsible for the upkeep of land records. Each field *qanungo* was responsible for the work of about 20 accountants and was himself supervised by the district revenue officers, while a Director of Land Records was made responsible for the land records work of the Province as a whole. These reforms were embodied in the revised edition of the Land Revenue and Tenancy Acts which came into force in 1887.⁴

The most important document contained in the record of rights is the record of title.⁵ Each field has a separate number given to it shown on the field map; and each plot of land lying in one spot in the occupation of one person (or of several persons holding jointly) is ordinarily measured as a single field. In the record of title⁶ the fields in each estate are grouped by proprietary holdings,⁷ and within each proprietary holding by cultivation holdings.⁸ A revised edition of this record is prepared for each estate every fourth year⁹ by the village accountant during the summer. It

¹ p. 206.

² A term derived from the Moghul land revenue system (see *L.F.R.* 38 ni, 190 ni, 269-71).

³ *patwari*.

⁴ *S.M.* 268; *P.A.R.* 249, 257.

⁵ *jamabandi*, i.e., register showing the distribution of revenue, a function which it still performs, (see Appendix VIII).

⁶ *jamabandi*.

⁷ *khata khewat*.

⁸ *khata khatauni*.

⁹ *P.A.R.* 254.



is supposed to be twice checked by the field *qanungos*, once in the village and once again when it is filed at the tahsil headquarters at the beginning of September. During the following winter the completed records are again checked by the Revenue Assistant.¹ This record of title is supplemented by a field map,² a genealogical tree,³ a list of revenue assignments and pensions, and a statement of rights in wells and in irrigation from other sources (if any). The field map is kept up to date by the preparation of supplementary maps⁴ shewing all changes made since the last settlement. The standing record (or the edition of the record of rights prepared at a settlement) contains also a village administration paper,⁵ which is a record of existing customs regarding miscellaneous rights and liabilities, such as the duties owed by the village menials to the proprietors of the village, and conversely their right to receive in return a share of grain at harvest.⁶ In old villages the first editions of these standing records were originally prepared at the first regular Settlement, but in the Canal Colonies their preparation is only undertaken when local conditions have attained some degree of fixity, and there is no prospect of many subsequent changes.⁷

The importance of the record of rights is enhanced by the fact that a presumption of truth is attached to all entries made in it,⁸ but at one time there was a good deal of confusion as to what the "truth" so presumed was, whether the record purported to reproduce things as they were or as they ought to be, whether, in fact, it was a record of rights or of possession. It was only in 1912 that these doubts were set at rest and it was finally decided⁹ that it was a record of rights and not of possession, though possession might often be the best means of determining right, *e.g.*, in the case of a mortgage or sale when one party affirmed, and the other denied, that consideration had passed.

¹ *P.A.R.* (1923-24) 134.

² *shajra kishwar.*

³ *shajra nasb.*

⁴ *tatimma shajra.*

⁵ by the acute brain of Sir Michael Fenton, Financial Commissioner, in 5 P. R. (1912) Revenue.

⁶ *wajib-ul-arz.*

⁷ *S.M.* 283-6, 295-6.

⁸ *C.M.* 547-8.

⁹ *S.M.* 278.

Existing entries in a record of rights (except entries relating to tenants-at-will) can only be changed in accordance with facts proved or admitted to have occurred, or agreed to by all the parties therein, or supported by a decree or order binding on those parties. The most important subsidiary register required to keep the record up to date is the mutation register, in which changes in proprietary ownership and hereditary tenants are shewn. Persons acquiring rights of this kind are bound to report them to the village accountant concerned; where such rights are transferred by registered deed it is the duty of the registering offices to send particulars through *tahsildars* to the village accountants. When a *tahsildar* or a *naib-tahsildar* visits a village he attests the mutations recorded in the mutation register, passing an order that they are accepted or rejected after hearing the persons interested; and only the changes so sanctioned in a formal mutation proceeding are incorporated in the next record of titles.¹ Every mutation order should show on the face of it the place where, and the date on which it was passed. It should also note that all the parties interested were present, or, if any one was absent, the way in which his evidence was obtained, or, if it was not obtained, what opportunity was given to him to be present. No detailed record of the statements of parties and witnesses is required, but the order should note briefly the persons examined and the facts to which they deposed. The facts on which the order is based should be stated succinctly but clearly; and the order must show without any possibility of doubt whether the revenue officer accepts the new entry proposed by the village accountant, as it stands, or, if it requires amendment, exactly what the new entry in the record is to be. The order must always show whether a share of the village common land² has been included in the transfer.³ The rapidity with which mutation work must be transacted if the record of titles is to be kept up to date tends to encourage slovenliness of procedure if the

¹ *jamabandi*.

² *shamilat*.

³ *L.A.M.* 383.

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Deputy Commissioner and Revenue Asistant do not adequately supervise mutation work. This can be best done when inspecting a tahsil office, whither the original copy of a mutation order is sent to be attached to the new quadrennial record of titles, as an authority for the new entries in the record. The copy retained by the village accountant contains only an abstract of the order passed.¹

While the mutation register records changes in ownership or mortgage rights, the crop registers² records not only the crop grown each harvest in each field but also changes in cultivating possession. It follows the order of the field numbers, no attempt being made in it, as in the record of titles,³ to group the fields belonging to one proprietor together. At each harvest the village accountant perambulates the village fields with the villagers, inspecting the crop, and noting against each field in the register the crop grown, and the changes in the cultivating possession which have occurred. In this way accurate crop statistics for each harvest are obtained, and any changes which have occurred in the boundaries of fields or in the rights to, or possession of, land are brought to light.⁴

The custody and upkeep of these village records is primarily the duty of the village accountant.⁵ Each of whom is responsible for a circle of about four villages, there being about 9,000 accountants to 36,000 villages in the Punjab. But his intimate acquaintance with the villages in his circle has also rendered the village accountant a useful agent in discharging a large number of miscellaneous executive functions. He is required to report to the *tahsildar* any calamity affecting the agricultural classes, and to bring to notice encroachments on Government lands, the formation or erosion of land through

¹ L.A.M. 373-4, 376, 380-84.

² *khasra girdwari*: See Appendix IX.

³ *jamabandi*.

⁴ P.A.R. 255.

⁵ *patwari*.

river action, the death of revenue assignees and pensioners, the progress of works financed by State loans, and the emigration or immigration of cultivators. He is expected to be ready to make surveys and field inspections, to aid in relief of agricultural distress and to draw up lists of voters for, and assist in, the elections held for the rapidly increasing number of constituencies, local, Provincial, and Imperial. It is his duty to allow any one interested to inspect his records and to supply extracts from them on receipt of a very moderate fee. When revenue collections are in progress, he must furnish any necessary information, and in cases of serious crime, he may be called upon to make maps to illustrate police enquiries.

Normally the village accountant has to make his own arrangements for accommodation. For this purpose he is generally able to get help from the village headmen.¹ He is still, in theory at any rate, not a Government, but a village, servant. But in his case the distinction is a remarkably fine one, and in these days purely Government work, such as the preparation of village electoral rolls, is freely thrown upon the village accountants. Consequently village communities do not now always realise their responsibility for providing accommodation for village accountants so clearly as in the past. Shortly before the Reforms Scheme came into operation the popularity-hunting Government of the period committed itself to the policy of providing an official residence for each village accountant. The policy was, however, soon scrapped when it was found that the extra expenditure involved was distasteful to the Legislative Council. Instead, the village accountant was compensated with a slight increase of pay and with the relaxation of the old rule under which he was compelled to live with his family in his circle; a relaxation which was the *fons et origo* of the slovenly land records work of the Maclagan era. Accordingly in 1924 Government decided to maintain only the 2,200 village accountants houses,² which were then in good repair, and to abandon both the remaining sites and the active

¹ *lambardar*.

² *patwar-khana*.



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policy of construction, thus reducing the maximum sum to be asked for from the Council for repairs to Rs. 25,000 per annum. The village accountants in whose circles these houses lie are held responsible for their upkeep (which includes the execution of ordinary annual repairs) and this responsibility is now strictly enforced. When a village accountant takes over a circle, he records an endorsement on the charge sheet that he has taken over the house in good condition and the *qanungo* and the *tahsildar* make special enquiries in cases of refusal to do this. A further check is provided by periodical inspections of village accountants houses by *qanungos* and *tahsildar* under the supervision of the Revenue Assistant.¹

Records of rights are maintained in Urdu,² so that a knowledge of English is unnecessary for village accountants. Consequently the tendency has been to take men whose educational qualifications are hardly sufficient for the combination of highly-technical knowledge with general common sense which is expected of them. Moreover the modern tendency is to throw upon village accountants an increasing burden of work, much of which is only remotely connected with their duties as petty officials of the Department of Land Records. Such, for example, is the work of preparing registers of voters for the Council of State, Legislative Assembly and Legislative Council. It is plain that the greater the amount of this miscellaneous work the more necessary it is to select men of a higher standard of intelligence, and of better education than formerly. It is not difficult for a man to fall into the routine of record work, and to perform his duties mechanically. It is much more difficult for him to do work which is outside that routine. Thus while it is essential that the standard of education should not be fixed so high as to lessen the supply of candidates from

¹ P.A.R. (1924-5) 67. This is at any rate what should be done: though this and similar duties tend to be scamped when the supervision of the Deputy Commissioner and Revenue Assistant are relaxed owing to the distractions of politics.

² i.e., Hindustani the general *lingua franca* of Northern India. In the Punjab it is written in the Arabic script.



the agricultural classes, it should not be so low as to admit men who will not be able to perform satisfactorily the miscellaneous duties which village accountants are now expected to perform.¹

A special training in land records work is given to all candidates at schools opened for the purpose every spring in various districts. No one can become a village accountant who has not attended such a school and passed a qualifying examination. As a result the village accountant is a particularly astute individual. His position puts a great deal of power into his hands, and being one of the lowest paid revenue officials he is not always slow to use it for his own pecuniary advantage if he sees a chance. A practice by which a village accountant can soon become wealthy is that of stirring up the people in his circle to quarrel about rights in land, both among themselves and with those in the neighbourhood. In the course of the law suits which follow many pickings fall to the share of the village accountant, who is called to give evidence regarding the entries in the records. The best safeguard against evil practices of this kind is frequent and careful inspections, which should be particularly directed to verifying by personal enquiry from the villagers that the record of titles² is accurate and up to date.³

The village accountant is under the immediate supervision of a circle supervisor known *Qanungos*. as the *qanungo*, an old Muhammadan title being thus retained. *Qanungos* are recruited to the extent of two-thirds of their numbers from village accountants of at least three years' service; the rest are selected, but must have passed the Matriculation Examination of the Punjab University. Ordinarily there is one field *qanungo* for about twenty patwaris, and office *qanungo* at each tahsil headquarters and a District *Qanungo*, with at least one assistant, at district headquarters. *Qanungos* have opportunities of promotion to the post of District *Qanungo*, the appointment of revenue

¹ P.A.R. (1922-23) 25.

² *jamabandi*.

³ *Buck* 86-93.

accountant¹ or a *naib-tahsildarship*.² In addition to the *qanungo* staff employed in districts, a separate staff is maintained for settlement work. This settlement *qanungo* staff is recruited from the *qanungo* candidates in districts, who serve in a settlement until a permanent vacancy occurs for them on the *qanungo* staff of their own district. It is the duty of the Director of Land Records to adjust the supply of settlement *qanungos* to requirements.³ In each district the District *Qanungo*,⁴ a promoted *qanungo*, is the inspecting officer of the land record work of the district both in the field and in the *tahsil* offices. He himself maintains the statistical registers relating to the whole district and is responsible for the custody of all land records filed in the district office. The responsibility of the *tahsildar* and his assistants for the inspection and correctness of the work of the *qanungo* and village accountant is, however, not affected by the duties of the District *Qanungo*. The *qanungos* are inspected by the *tahsildar* and his assistant, who are expected to verify the crop entries field by field in estates subject to the fluctuating system of assessments, and 25 per cent. at least of the entries made in the record of titles⁵ of each estate. It is the duty of the Revenue Assistant to see that this duty is carried out properly and efficiently.⁶

In spite of their temptations, the land records staff of *qanungos* and village accountants compares favourably as regards honesty with the lower ranks of other departments.⁷ Black sheep there may be among the land revenue staff, but the department is not corrupt as a whole, and shews no symptom of that tendency to shield dishonest subordinates which is so fatal to the fair name of some other Departments. But the example of deterrent punishments alone is

¹ *Sadar wasil bagi navis.*

² *P.A.R.* (1923-24) 127.

⁴ *Sadar Qanungo.*

⁵ *jamabandi.*

³ *P.A.R.* (1923-24) 128.

⁶ *P.A.R.* 271.

⁷ A tribute to their comparative honesty was made in the Punjab Legislative Council, when the attempt was made to cut down the horse allowance of *qanungos*. *P.A.R.* (1924-5) 127.



not sufficient to maintain a high standard of integrity amongst capable subordinates. They must have some legitimate outlet for their ambition or they will turn their talents to dishonest money-getting. Accordingly land revenue officers of the old school were insistent on the necessity of keeping a *carriere ouverte aux talents* for the village accountants. In those days capable village accountants had very fair chances of promotion to higher posts. The appointments of tahsil revenue accountant¹ and tahsil cashier² were, whenever possible, reserved for them, and two-thirds of the *qanungos* had to be promoted *patwaris*. Once he became a field *qanungo*, a village accountant might hope to climb still higher on the official ladder and a capable and honest accountant might often end his career in the responsible and dignified post of *tahsildar*.

But the neglect of land revenue work that characterised the early Reforms period meant the neglect of those who performed it, and particularly of the hard-working village accountant. Other forces also were working against him. The old division of district offices into English and Vernacular offices³ had now become an anachronism, as most clerks in the Vernacular office now knew English. To remove this and other anachronisms a Clerical Establishments Committee was appointed in 1912, which after a period of gestation of nine years brought forth a report in 1921.

"*Parturiunt montes, nascitur ridiculus mus.*" As a result the English and Vernacular offices were in 1921 joined together under the control of the Head Clerk who was raised to the dignity of Superintendent and for practical purposes the office of S. V. O. was abolished. The idea seems to have been that now that most clerks doing vernacular work knew English, there was no necessity for a separate English office to put up English drafts of vernacular reports. In practice, however, the result was to maintain the English office at approximately its previous size, while putting on

¹ *Wasil baqi navis.*

² *Siyaha navis.*

³ See p. 70.



the vernacular clerks the burden of doing English drafts of their reports. The Committee ignored the fact that while the "Vernacular" clerks had learned English, the "English" clerks had not acquired the highly technical knowledge of land revenue work which could alone enable a clerk to work in the "Vernacular office." The Superintendent being promoted from the "English" office, could not understand the land revenue work of the "Vernacular" office, still less the claims of those who did it; and as a result the standard of land revenue work seriously deteriorated both within and without the Deputy Commissioner's office.

Not the least of the reforms introduced by Col. The Director Wace in 1885 was the creation of a new provincial department of rural economics and Agriculture, represented in the district by the Revenue Assistant to the Deputy Commissioner, whose main duty was to take charge of all matters connected with the economic condition and well being of the people. The executive head of the Department was the Director of Land Records and Agriculture, chosen for his knowledge of the condition of the people and particularly of the agricultural classes. His special functions were to advise the provincial Government on all matters connected with agriculture and statistics and superintend all measures designed to improve the agriculture of the country.¹

Experience, however, soon proved that these ideals were too high for the normal Director of Land Records; and the creation of a separate Director of Agriculture in 1906² finally destroyed any hope of tackling the problem of rural economics seriously. Instead of a Rural Economist the Province had now a Babu and a Bug-hunter. The Director of Land Records degenerated into a peripatetic routinist, unable to take broad views, and confining his attention to pointing out technical breaches of procedure on the part of office *qanungos* in long and prosy notes, which were fortunate if they received so much recognition as a yawn;

¹ L.F.R. 272.

² L.A.M. 209.



from the Deputy Commissioner to whom they were addressed¹; while the Director of Agriculture, divorced from statistical realities, devoted himself to the development of demonstration farms, which merely demonstrated that his agricultural methods were more costly than those followed by the Punjab peasant.

So futile did the functions of the Director of Land Records appear to a generation which had grown to despise the technicalities of land revenue, that in 1922 it was seriously proposed to abolish the post. But wiser counsels prevailed, it being realised that there was still use for an expert whose duty it was to advise district officers on all matters connected with the land records establishment, and so to ensure that adequate attention was given to land records work. This advice was mainly given in the form of inspection notes of the tahsil and district *qanungo's* offices, in which land records were preserved.² Moreover with the abolition of the office of Settlement Commissioner in 1910³ some continuity in control over the record and mapping work in Settlements was required, while the amalgamation in one cadre of Settlement and district *qanungos* also necessitated a co-ordinating officer, whose modest duties might fitly be entrusted to the resuscitated Director of Land Records⁴.

3. AGRICULTURAL STATISTICS.

“A government primarily collects numerical information only in relation to its own functions”.....Bowley 10.

In India the main source of Government income has always been land revenue. As long as this Value of Agricultural Statistics. was collected in kind, there was no urgent necessity for the preparation of crop statistics; but when cash rates were imposed, it became desirable for the Government to get some estimates of the actual outturn of the crops, from the sale of which the cash revenue required would be obtained. This has been particularly necessary

¹ I.A.M. 209.

² P.A.R. (1923-24) 123. I held the office of Director of Land Records from 1923 to 1927 and did my best to galvanise life into the moribund body. ³ para 65. ⁴ P.A.R. 257.

in a province like the Punjab, where the landowners are mainly small proprietors, cultivating their own holdings, and where therefore it is very difficult to deduce assessment rates from the rents paid by the tenants to landowners. But the War gave an additional importance to estimates of outturns of food-grains. At that time the outturn of food-grains ran short of requirements all over the world, and in every country governments began to estimate their stocks in hand and their probable requirements. India being a self-supporting country, the problem did not arise there so acutely, but large exports during the War followed by a particularly bad harvest in 1920-21 caused a shortage, which caused prices to rise considerably. The export of wheat was prohibited under a law framed to meet War emergencies. Great doubt was felt as to whether the stocks in hand were or were not adequate for feeding the population. The difficulty of coming to an estimate as to their amount, and the importance to Government politically of securing that the population had enough food to live on, all drew increased attention to the value of accurate crop statistics.¹

These are, however, recent developments and the methods at present in force were based originally on the requirements of the land revenue system. It was Akbar² who first substituted a cash assessment for payments of land revenue in kind. He "fixed his claim at one-third of the gross produce, and in order to realize the revenue on this basis his officials determined the average yield of every crop grown in the country, and fixed cash rates representing one-third of this average yield valued on the results of ten years' experience. The area sown with each crop was recorded season by season and the demand on each peasant was calculated by applying the sanctioned rates to the area which he had cultivated."³ The seasonal crop statistics were an essential feature of Akbar's regulation system of assessment.⁴

¹ A.J.I. May (1924) 232-3.

² P. 7.

³ Moreland 99.

⁴ Moreland 81.



Though these methods were improved on by the British Government the principle of assessment remained the same. The rule laying down the standard of assessment is now as follows :—

“The assessment of an estate will be fixed according to circumstances but must not exceed half the value of the net assets, a phrase which is defined as meaning “the average surplus which the estate may yield after deduction of the expenses of cultivation, including profits of stock and wages of labour.” When the rents are fair competition rents, 50 per cent. of the rental is considered to be the measure of the half assets share of rented land, and the rates ascertained from these rents for all classes of soil are applied to the whole cultivation, whether by the tenants or by the owners. Wherever cash rents prevail they can be ascertained from the record of rights, but considerable difficulty is encountered in converting produce rents into a cash rate. The area of each crop is of course known, but estimates have to be made of the outturns of each crop, the actual share received by the landlord and the prices obtained by him for his produce; all of which owing to the uncertainty involved are probably usually under-estimated. In practice it is recognized that there are many reasons which may justify a Settlement Officer in assessing below the maximum standard, but he is required to state as accurately as possible what the half net assets are, and to give good reasons for any proposal to fix the Government demand much below that standard. No particular fraction of the gross produce is prescribed as the limit of the land revenue demand, the only limit being that just mentioned, *viz.*, half the value of the net assets¹.”

But the accuracy of a Settlement Officer's crop estimates is inevitably marred by his bias in the direction of safety. If he over-estimates the gross produce there is a danger of the settlement breaking down, if he under-estimates no great harm ensues except the slight loss to Government. His estimate is, therefore, like an engineer's estimate of the breaking strain of a bridge; it is essential that he should provide a

¹ P.A.R. 258.

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large margin for safety. He is, moreover, an officer who moves about amongst the people and is bound to be influenced by "the inherent pessimism of the farmer"¹ in estimating the produce of his land. For all these reasons, therefore, while the method of obtaining crop statistics for settlement purposes has great value, there is an inevitable bias in the direction of under-estimating the outturn.²

Previous to 1885 the most important agricultural statistics were those entered in the Village Note Books, which were revised every Settlement. But once the Settlement was over, no attempt was made to keep these records up to date; indeed, with the agency then existing, such an attempt would have been vain. This is clear from the fact that Settlement Officers found it impossible to make any use of most of the statistics which village accountants were supposed to collect, and could not even find statements of the results of past harvests on which they could place the least reliance.³ But the Indian Famine Commission of 1880 was of opinion that the basis of effective action by the Imperial Department of Revenue and Agriculture, which they wished to set going, would mainly depend on the completeness and accuracy with which agricultural and economic facts were collected in each village, and compiled in each sub-division and district, throughout the country. Without a perfect system of local information, the warnings of approaching troubles would be lost or misunderstood, and the liability of different parts of the district to calamity, the weak points on which a watchful eye had to be kept, would not be known; and relief, in the shape of remissions and suspensions of the revenue demand, would be given imperfectly and with the least benefit.⁴ The revenue system in the greater part of British India was such as to present unrivalled means of ascertaining in the fullest

¹ Stuart G.A.D. The seasonal factor in crop statistics. A method for correcting the inherent pessimism of the farmer. *A.J.I.* (April 1919).

² Wheat Forecasts in the Punjab by H. K. Trevaskis, *A.J.I.* (May 1924) 233-4.

³ *L.A.M.* 396.

⁴ *L.A.M.* 271, *L.S.B.I.* Vol. I, 349-54.

Agricultural
Statistics the
bases of rural
economics.

manner all necessary facts relating to agriculture and to the different incidents of landed tenures in every village, but those means had nowhere been completely utilized and made as efficient as they might be.¹

"The proper function indeed of statistics is to enlarge individual experience. An individual is limited to what he can himself see, a very small part of one division of the social organism; his knowledge is extended in various ways, by the conversation of his acquaintances, by newspaper reports, by the writings of experts. According to his ability and power of judgment, he will be able to form a correct view of the numerical importance of groups of persons and things, but it is in the highest degree improbable that he will not have been biassed by the peculiarities of his position, and that he will place his different items of information in the right perspective, and will not be able to gauge rightly the accuracy of his data. As soon as he begins to examine these points he is undertaking a statistical investigation, and will very soon find himself involved in all the difficulties and problems from which a knowledge of statistical method alone can disentangle him. This is the obvious answer to those who deny the use of statistics. A statistical estimate may be good or bad, accurate or the reverse; but in almost all cases it is likely to be more accurate than a casual observer's impression, and in the nature of things can only be disproved by statistical methods."² "When a man is found decrying statistics there is often ground for suspecting that he is either too lazy or too ignorant to make a proper use of them."³

The improved statistics recommended by the Famine Commission were introduced into the Punjab by Col. Wace in 1885. Based on the records of rights and crop inspections made by village accountants, they not only give information as to ownership, tenancy, rents, and transfers, but also as to the area of each crop sown and matured on each class of

¹ L.F.R. 271.

² Bowley 9.

³ L.A.M. 397. This opinion of the eminent Scotch Financial Commissioner, Sir James Douie, will perhaps carry more weight with the official mentality than that of the Professor of Statistics quoted previously.

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soil at each harvest in every village. In practice, however, these statistical returns were more utilized by Settlement Officers as a basis for the assessment of land revenue than by Government as a guide to the economic conditions of the people.

For land revenue purposes what was required was not so much accurate statistics of outturn as a conventional figure on which the Settlement Officer could base his assessment. But with the development of the wheat export trade, combined with the possibility of the food supply of the population falling short of what was vitally necessary, there arose a desire for getting results more in accordance with actual facts.¹ "In 1883 a leading firm of Liverpool merchants interested in the wheat trade represented to the Secretary of State for India, through a member of Parliament, that the publication of information about crops in India, somewhat on the plan adopted by the United States Department of Agriculture would be useful to persons engaged in business with that country."² Originally the statistics of outturn were prepared after the crop was gathered, but the commercial community found that this was too late to be of any service to them. The Government, therefore, decided to issue crop forecasts in advance so that the exporters might be in a position to estimate what amount would be forthcoming. It is, therefore, clear that these crop forecasts were mainly intended for the benefit of commercial people, though Government took care to safeguard itself by saying that they were primarily (a) for the general information of the public, and (b) for the information of Government, and only secondarily for the benefit of the trade.³ Moreover the revival of interest in rural economics due to the activities of Mr. Calvert in the Co-operative Department led to a demand for accurate statistics to prove or disprove the theories that were being continually put forward. But though the statistics

¹ A.J.I. (May 1924) 235.

² A manual on the preparation of Crop Forecasts in India (Department of Statistics, India) Ch. I.

³ A.J.I. (May 1924) 237-8.

available were now mainly required for commercial or economic rather than land revenue purposes the method of their collection remained essentially the same and tended to suffer from the same under-estimate as previously.

The most important of these statistics are contained in the Village Note-Books,¹ which are compiled from the village accountants' mutation and crop-inspection registers.² These Note-Books are arranged so as to enable each village accountant to keep a continuous record of the statistics relating to each village during the period between two Settlements. They give valuable statistical information as to the agricultural conditions of each village.³ Separate registers are maintained at the *tahsil* headquarters showing this information for all the villages in each assessment circle and in the *tahsil* as a whole, and at the district headquarters for this district as a whole. Totals for the Province are subsequently compiled and are available to the few who understand where to look for them though the uncouth language and occult symbolism of the reports in which they are published must invariably render them unintelligible to the commercial and general public—in fact to all except a few dry-as-dust Revenue high brows.⁴

A summary of the statistical information given in the Village Note-Books is given in the Abstract Village Note-Books in which Deputy Commissioners and Revenue Assistants are supposed to make remarks for the benefit of future Settlement Officers on the economic conditions of the villages which they visit on tour. The information thus provided would be invaluable, were the duty properly performed. For a few years after their introduction in 1896, a few sketchy

¹ *lal kitab*—red book so called because bound in red covers.

² pp. 183, 184.

³ Each Note-Book contains (1) A yearly register of area (*Milan Ragba*) (Appendix X), (2) Summer (*kharif*) and (3) Winter (*rabi*) crop registers (*Jinswar*) (Appendix XI), (4) Yearly Revenue Accounts (*Jama Wasil Baqi*), (5) Statement of transfers of rights of ownership and occupancy tenants, (6) (Quadrennial) abstract of ownership mortgages and revenue (Appendix XII), (7) (Quadrennial) abstract of cultivating occupancy (Appendix XIII), (8) Statement of rent paid by tenants-at-will; (9) Quadrennial return of Cattle, Carts, etc. (Appendix XIV).

⁴ *L.A.M.*, 404-7.

records were indeed made in these Note-Books by Deputy Commissioners, but the practice languished during the War, and became practically extinct during the Maclagan era, when the punctilious performance of dull duties was nothing accounted of in comparison with a glozing tongue, and a brazen cheek.¹

To the commercial community the statistics of most importance are the crop forecasts, four of which are prepared for the principal export crops of wheat and cotton and a lesser number for four other crops. Of these the first two forecasts for wheat and cotton deal with area only, and are admittedly rough estimates, the last two forecasts are the important ones. The third forecast for wheat is issued in April and gives the area and outturn at the time of harvest. The fourth forecast which is issued in the middle of May, estimates the crop when it is nearly harvested. The two last forecasts generally approximate to each other, though in years such as 1923, when the rain damaged crops on the threshing floor, the estimates may differ considerably. These two reports stand on a different footing from the preliminary ones both as regards objects and constitution, for, whereas the last two reports, being largely concerned with outturn, are estimates of the quantity of crop actually to be handled, the earlier reports are only aids to conjecture as to what that quantity will be.² An abstract of the results of the summer harvest is published annually in the Punjab Gazette, and a more detailed statistical survey of both harvests is given in the Annual Season and Crop Report, which, however, is published too late to be of interest to any one but historians.³

The statistics so published are calculated to inspire confidence as regards the *areas* under particular crops, for these are based on the village accountants' harvest inspections. Less convincing

¹ L.A.M. 404-7.

² P.A.R. (1923-4) 137.

³ Stung by the sarcasms of commercial friends, when Director of Land Records I made frantic endeavours to accelerate publication; but after my removal the report for the year ending with the winter harvest of 1927 was not available till the beginning of 1928, i.e., about a year late.

are the estimates of outturn. These were originally determined with reference to experimental cuttings and the information obtained by verbal enquiry. The experiments were many, but the area observed in each case was small and the results were admittedly of little worth. Moreover, such experiments would generally be made on land which could at least produce a fair crop, and they thus ignored the considerable areas of land yielding very little crop at all, so that yields estimated in this way tended to be considerably above the true arithmetical average.¹ The reforming zeal of Col. Wace² increased the size of the areas selected for the experiments,³ but though some interest is still taken in the matter when a Settlement is actually in progress, the subsequent experiments made by Revenue Assistants harvest by harvest are perfunctory and pointless.⁴

Such crop experiments must be limited in number, and can only be useful as a check on the much larger number of estimates made by appraisement. Experience, however, has shewn that such estimates even when made by Director, a Deputy Director, and a Professor of Agriculture are from 25 to 47 per cent. wide of the mark.⁵ Moreover the crop experiments are never used to check such appraisements, but are merely used as bulwarks of conservatism, any untoward results being promptly rejected as "abnormal,"⁶ while in some cases an "abnormal" season is made the excuse for doing no experiments at all.⁷ Crop experiments of unirrigated wheat in one small circle of the Attock District gave results varying from 264 to 640 pounds per acre.⁸ Within such wide limits "estimate" ceases to have any meaning, even to one who piously observes the precept that "the average will be calculated not from the averages

¹ L.F.R. 264.

² p. 190.

³ S.M. 79.

⁴ L.A.M. 818. Sir James Douie adds (*horresco referens*,) that "these experiments should be made, if possible, by a European." But this was before the Reforms Scheme.

⁵ I.E.A. (5) 86.

⁶ S. M. 325 Appendix X.

⁷ Attock Tahsil Settlement Report 90.

⁸ Attock Tahsil Settlement Report 95. This report of the late Mr. Barry, I.C.S., shews a painstaking industry which is nowadays all too rare, and accentuates the loss felt by all his friends at the premature death of its gifted writer.

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of individual experiments, but from the total outturn of all experiments with that crop on each soil.”¹ From these results the Settlement Officer has to guess at that average for (say) unirrigated wheat which he thinks is least likely to provoke the criticism of the Financial Commissioner’s clerks who may have never seen a wheat field in their lives. These Settlement averages are then doctored every five years after consultation “with the local officers of the Revenue and Agricultural Departments” and the result is given as the average outturn for a whole district for the next five years,² and it is from this average that the official estimates of so-called normal outturn are deduced.³

Each harvest the *tahsildar* is supposed to estimate for each crop (irrigated and unirrigated separately) what he considers to be the percentage of this so-called normal, which is the actual outturn per acre for that year. To do this directly would require a statistical agility which is far beyond any *tahsildar*, and in practice the *tahsildar* estimates in maunds⁴ per acre what he thinks is a reasonable amount and then converts it into a percentage of the so-called normal. These results, which are generally calculated for the *tahsildar* by the office *qanungo*, are then sent to the district *qanungo* who deduces an all round percentage for the district. These percentages may be modified by the Director of Land Records, or in the case of the important commercial crops of wheat and cotton by the Director of Agriculture, who compares them with estimates arrived at by officers of his department.

The fallacy underlying this procedure lies in the assumption that the term “average yield per district” has any meaning at all. The term “average yield” is vague. Average yield may mean the arithmetical average or the

¹ S. M. Appendix X 6.

² Season and Crop Report, 1926-7. Explanatory note to Statement V.

³ The average yield for 1926-7 is based on the years 1917-18 to 1921-22. When Director of Land Records I recommended that the average should be taken of the five years immediately preceding the year under consideration, but this proposal was rejected as too revolutionary, I am inclined to think it was too conservative and would have only given a fallacious appearance of accuracy to a system inherently vicious.

⁴ See Appendix XV.

yield of the most frequent type of land of a particular class. As regards time also, it may refer to the arithmetical average, over a number of years or to the most ordinary type of harvest. For example, in large areas of a district like Hissar, two or three years with no irrigated winter crop at all may be followed by a bumper gram crop of (say) 20 maunds¹ to the acre. What is going to be the average unirrigated outturn for gram? Again take Mianwali, where the rainfall diminishes steadily towards the south. The normal unirrigated gram outturn per acre in years of good rainfall also varies with the latitude. To the north 15 maunds² to the acre would not be unusual if there are moderate rains, while in the south it would be difficult to obtain more than five maunds³ an acre. What is going to be the average unirrigated yield of gram in the Mianwali District? Moreover, even supposing that an arithmetical average were obtained, the total area multiplied by the average outturn will not give the true total outturn.⁴

The only way of eliminating these difficulties is to base estimates of average yield on the village level way.⁵ instead of the district as a unit for taking averages. This can only be done by the village accountant, who is, moreover, in the best position to frame accurate estimates of yield, not only by taking the opinions of cultivators, but also from personal observation of the amount of grain which is garnered from a particular piece of land. Thus it would be quite easy for him to frame yield estimates each harvest or each crop on each class of land⁶ in his villages. In this way a separate yield estimate would be obtained for each small area over which the yield was uniform. This method would

¹ 27 bushels.

² 20 bushels.

³ 7 bushels.

⁴ See Appendix XVI, *AJI* (May 1924) 238-9. *EJ* (September 1926) 395-6.

⁵ This paragraph contains an abstract of proposals made by me to Government several times (unavailingly) when I was Director of Land Records; and also in an article (May 1924) to the *Agriculture Journal of India*.

⁶ i.e., *sailab* (irrigated by percolation), *chahi* (irrigated by well *nahri* (canal irrigated), *barani* (unirrigated).

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do away with all the inaccuracies of estimates which are based on the average yield of the whole district. The village accountant having given his estimate of yield in this way, the area under each crop is known accurately from the land-revenue papers, and each village accountant can, therefore, estimate the outturn of his village.

A forecast of considerable accuracy can thus be obtained, provided the village accountant's estimates of yield are accurate. The village accountant could then more easily frame such estimates from the fact that he is already trained to make rough estimates of outturn with reference to the mythical normal. Should the outturn be half the normal he enters half the area as failed,¹ and so on.² It is an imperfect method but it has in it the stepping-stones to higher things, and it is, therefore, the more extraordinary that no use, whatever, is made of these village accountants' estimates of so-called failed and matured³ crops in the published statistics of outturn. It is true that the village accountant probably tends to under-estimate the outturn, (1) because, as has been pointed out above, the whole land-revenue assessment has a bias in favour of under-estimating, (2) because the cultivator, on consultation with whom he will largely base his estimate, will always under-estimate his outturn with the object of obtaining a low assessment of land revenue, (3) because of the "inherent pessimism of the farmer" which is notorious throughout the world. But this tendency to under-estimate is fairly constant with all village accountants, and if allowance be made for it, a far higher level of accuracy can be obtained than by other method. The village accountant is generally in close touch with all matters affecting the agriculture of his circle, and it would be impossible to find in the Punjab instances such as one quoted from Madras 'where no village accountant kept any accounts and where all figures were invented at the close of the year.'⁴

¹ *Kharabz.*

² L.A.M. 352-4.

³ *pukhta.*

⁴ Start G.A.D. in *A.J.I.* (April 1919).

The tendency to under estimate will be more or less uniform year to year, and it would be better to correct such an under-estimate by adding the necessary percentage to the total outturn rather than by attempting to doctor the result of each village accountant in each village.¹ It should be remembered that "in the present state of our knowledge, many statistical measurements cannot be made with precision for want of data, and a critic is inclined to say that for this reason preliminary estimates are valueless, but from the scientific point of view the criticism is wrong; for a faulty measurement made on logical principles is better than none, if limits can be assigned to its possible error, and it may lead to others with progressive improvement."²

The estimate of the cash value of produce for assessment purposes necessitates some record of harvest prices, *i.e.*, the prices which the cultivator can actually get for his produce at harvest time. These are recorded every harvest in the Assessment Circle Note Books³ in accordance with reports received from *ganungo*. Certain price lists are maintained as a standard of value for purchases made for military or administrative purposes. Such are the register of the retail prices at district headquarters of the principal crops and of salt and firewood, which is kept up in all districts by the district *ganungo*. More valuable for commercial purposes, however, is the fortnightly publication in the Punjab Gazette of the wholesale prices of raw sugar,⁴ clarified butter,⁵ cleaned cotton, and the principal food grains. In the Gazette are also published weekly reports from fourteen districts showing in a brief and succinct form for each district, and for the Province as a

¹ I have shewn how this may be done in Appendix XVII which is reproduced from my article in *A.J.I.* (May 1924) 242-9. This discussion involves some elementary algebra which though perfectly intelligible to an educated flapper, smacked of the black art to a Financial Commissioner and I have, therefore, relegated it to an appendix.

² Bowley 5.

³ P. 197.

⁴ *gur*.

⁵ *ghi*, butter boiled down and strained, which in that state keeps indefinitely and is largely used by all classes for cooking.

whole, the actual conditions and prospects of agriculture. A large amount of valuable statistical and other information is also to be found in the District Gazetteers the statistical part of which is revised every ten years and the remainder at every district Settlement. Unfortunately few of the general public are aware of even the existence of these publications, and Government, with characteristic lack of State enterprise, so far from advertising them, seems to put every difficulty in the way of those who wish to buy a Gazetteer. Even the valuable district "skeleton" maps shewing village, *tahsil* and district boundaries, together with railways, main rivers, canals, roads and other prominent features of the district are mainly utilized by Government departments and hardly wotted of by the commercial or general public.²

Thus, while Government has in its land revenue staff a machinery for the collection of agricultural statistics, which cannot be matched elsewhere in the world, the information provided is not abreast of the economic conditions of the day, and in the case of crop yields is definitely inaccurate. Moreover, the statistics are generally published in a form which is incomprehensible to those who do not make a special study of them. In 1924 an attempt at improvement was made at the instance of Sir Malcolm Hailey. A committee was appointed consisting of Mr. Calvert, Registrar of Co-operative Societies and afterwards member of the Agriculture Commission, the Director of Land Records,³ the Director of Agriculture, the Senior Secretary to the Financial Commissioners, the Professor of Economics of the Punjab University,⁴ and Mr. Owen Roberts, a leading grain merchant of the Province. The committee were unanimously of the opinion that certain changes should be made in the statistics published in the Annual Season and Crop Report. For two years the Financial Commissioners kept these proposals in

The bull
"Meum sta-
tisticum."

¹ S.M. 331, 335, 337 Appendix XI, L.A.M. 819.

² S.M. 552, L.A.M. 835-6. ³ myself.

⁴ Professor Myles, of Board of Economic Enquiry fame.



the sessions of sweet silent thought. Then for a moment the clouds rolled back from Sinai and the mighty voice spake "Thou shalt not change my statistics." The bull "*Meum statisticum*" was so far final that it prevented all change in the statistics that existed, but Mr. Calvert, in his zeal for information in rural economic questions, endeavoured to avoid the *impasse* by having summary enquiries on special subjects made in selected villages in a specific year. Such enquiries, however, being outside the ordinary routine, were apt to be perfunctorily performed by the revenue staff. Moreover, the question arose as to how far the villages so selected were typical, while the information being confined to one year only, was useless for tracing tendencies over a longer period.

Clearly the new statistical wine cannot be put into the old bottles so beloved of Financial Commissioners. Instead the Statistical Branch of the Director of Land Records Office should be expanded into a definite Statistical Department of Government, which should deal primarily with agricultural statistics, and should, as far as may be convenient, also deal with industrial and other statistics. The duty of such a department would be to keep in touch both with other departments and with business and agricultural interest with a view to seeing how far such information could be made more popular and how far its accuracy could be increased. This department would also keep in touch with other departments and particularly with the Agricultural Department with a view to supplementing from them the statistical information received from the Land Revenue authorities. From the figures so obtained "it would have to pick out the significant figures, so to present the totals and averages as to give a true impression to an enquirer, to summarise briefly the information obtained, to concentrate the mass into a few significant averages, and to describe their exact meaning in the fewest and clearest words, for it is the result of this concentration which will generally be used and quoted.

To do this skilfully requires an acquaintance with the method of averages and the use of diagrams. It may further be necessary to fill in unavoidable gaps in the figures in order to supply estimates for intermediate years, this needs a study of the dangerous method of interpolation. Finally, a verbal description of the process, its genesis and results, and an estimate of its accuracy must be written. It should also be seen whether the number of returns for each group is proportional to its importance, or a specially important figure depends on only slight evidence.”¹

As the main source of information would still continue to be the Land Revenue Department, the Statistical Department should be under the Director of Land Records. Such a department would (with a slight temporary expansion) be in a position to undertake the decennial Census of the Province and would thereby save the Government of India a considerable expense which would probably go far towards paying the extra cost of the Department. As a consequence the Provincial Statistical Department would have in its possession all the material collected for the purpose of the Census, and this material would be invaluable as a check on subsequent Statistical information.

4. SETTLEMENTS.

And it shall come to pass at the ingatherings, that ye shall give the fifth part unto Pharaoh, and four parts shall be your own, for seed of the field, and for your food, and for them of your households and for food for your little ones.

Genesis xlvii. 24.

The process by which the Government officials determine the amount of land revenue payable is called a settlement (of land revenue); and the person or the body whom Government recognizes as entitled to be proprietor, subject to the revenue payment, is said to be ‘settled with’ or to ‘hold the Settlement.’² A settlement, therefore, requires not only the determination of the land revenue payable on each area of land, but also the framing of a record of rights to

¹ Bowley. 16-17.

² P.A.R. 245.

determine who is the proprietor who is to pay it. The first settlements were necessarily, therefore, elaborate affairs, as the record of rights was only revised when a settlement took place. The present system of record and preparation of statistics is associated with the name of Col. Wace, to whose initiative the reforms introduced from 1885 onward are due. It was the previous policy to undertake a revision of the map and record only. In 1885, however, the reforming zeal of Col. Wace introduced a village record agency capable of maintaining up-to-date the village field maps and record registers, his object being to obviate the necessity for general revisions of the record of rights at settlement.¹

Unfortunately his tragic death in 1889 removed the driving force required to make the new system work. The measures prescribed for the keeping up of village maps, and record of rights were not properly carried out. Orders were not promptly passed on questions of land-transfer and decisions on questions of the partition of holdings (to which the agnatic system of inheritance continually gave rise were unnecessarily postponed. Consequently that general revision of land records, which it had been hoped could have been avoided under the new system, still continue to delay the work of assessment. The settlement army of occupation still descended on the fated districts, sometimes to leave the last state of their land records worse than the first.² Most human organizations reverse Aristotle's dictum on the State.³ They come into existence to subserve some interest of humanity, and they continue to exist to subserve their own interests alone. The settlement organization is no exception to this rule.

Government will not, however, sanction a Settlement till a preliminary report (generally made Preliminary measures in connection with a Settlement. by the Deputy Commissioners) has been received and considered. This report will not only deal with the gross amount, but also with the character of the existing assessment, the suitability of its

¹ P.A.R. 257.

² L.F.R. 278.

³ γινωμενη μὲν τοῦ ζῆν, ὅσπερ δὲ τοῦ ἐν ζῆν.



form to local circumstances, and the fairness of its distribution over estates. Cases may occur in which an assessment is so high, or so bad in form or distribution, as to require revision quite apart from the question whether reassessment will yield any profit to the State commensurate with the cost of making a new Settlement.¹

Should the report succeed in convincing Government that a settlement was necessary, the next thing used to be to send the Settlement Officer to the devoted district, where he would spend this first cold weather of Settlement operations in collecting round him inkpots, cupboards, *ganungos*, tents, *tahsildars* and all the other paraphernalia of Settlements, much angry correspondence with the Deputy Commissioner being generally necessary before the latter would disgorge enough "equipment" to satisfy the Settlement Officer. Not one of the least merits of the Reforms Legislative Council was its criticism of the dilatory method of conducting Settlements. As a result, a memorandum was drawn up in 1925² arranging for the posting of the Settlement Officer's Assistant to a district in advance of the Settlement in the capacity of Revenue Assistant, and laying on him the duty of agitating for staff, accommodation, equipment, tents, furniture, survey implements, books, stationery, forms and maps in advance of the incoming Settlement Officer. It also lay with the Director of Land Records to devote himself specially to the supervision of the records of those districts where Settlements were expected.

The wrangling between the Deputy Commissioner and the Settlement Officer which characterises its commencement generally continues throughout the duration of a Settlement. "Ten beggars may sleep in one blanket, but two kings may not dwell together in one kingdom":—so sang the Persian Poet;³ and on this principle the Deputy Commissioner, as king of the district, must needs resent

¹ S. M. 223

² by me, as Director of Land Records.

³ Sadi in the Gulistan

Do Badshah dar aqlime name gunjand
Wa dah darvesh dar galime bakhaspand



this rival king, marching through his kingdom, and through his powers of taxation often commanding more respect and obedience than the lawful monarch. The very ubiquity of the Settlement Officer adds to his power and influence. "For a Civilian the post offers the best life and the most fascinating work to be found in India. It is the basis of all real knowledge of the rural masses. For six or eight months in the year he lives and works among them, almost exclusively. He learns their inner life, their trials and hardships, their joys and their sorrows. He deals with them in their fields and their villages, where they are at their best, rather than in the law courts, where they are at their worst; for they are then endeavouring to circumvent, often by fraud or false evidence, the various obstacles in the shape of legal formalities which, to their minds, we have placed between them and justice. When an Indian rustic comes into the atmosphere of a Court, he has his mind made up to swear to anything that he thinks will suit his purpose, and it is no light task to get the truth out of him. Put the same man in the same cause in the village square,¹ or under the village tree among his own people, and he will hesitate to lie even in a good cause. That is why the peripatetic justice, to which the Indian lawyer and the Indian politician so strongly object, as wanting in legal formalities, is so much more speedy and satisfactory."²

In order to carry out either of the two branches of his work—the framing of a record-of-rights or the making of a fair assessment—a Settlement Officer must have an accurate map of each village, showing the position and boundaries of every field. There are two surveys with which he is concerned—the topographical survey made by the Imperial Survey Department and the cadastral or field survey made by the village accountants. The second is indispensable for his work, the first is chiefly useful to him as a means of testing the accuracy of the second. The methods used in both cases are scientific. The processes followed in the second are of

The two survey systems.

¹ *Chauk*, the central meeting place of the village.

² *O'Dwyer* 52-3.

course much simpler than those employed in the former, but experience has proved, that, properly applied, they secure a degree of accuracy sufficient for all the purposes for which revenue officials employ village maps. The Imperial Survey deals with villages as a whole, mapping their boundaries and showing the main topographical features, such as the homestead,¹ roads, canals and large sheets of water. The limits of the cultivated culturable and barren land have also sometimes been indicated. The boundaries of every field are shewn in the village maps of the cadastral survey, and by means of it the areas shown in the record-of-rights² are calculated. The topographical survey is based on certain fixed points known as "traverse points" whose position is accurately ascertained by the Imperial Survey Department, while the cadastral survey is based on points marking the corners of survey squares or rectangles. All these points are marked by stone or masonry pillars.³ The connecting link between these two survey systems is provided by the trijunction pillars⁴ which are placed at each point where three villages meet, and their proper maintenance is therefore a matter of vital importance. In the plains the cadastral square system provides a sufficiently accurate basis for field delimitation, but in the hills reference must be made to the traverse points of the Survey of India. This Department must also be relied on for fixing points in riverain tracts, and for this purpose special Riverain Survey parties have been deputed by the Imperial Survey for fixing points in those parts of the bed of the Chenab and Indus rivers where Settlements are in progress.⁵

The basis of a regular Settlement is the preparation of a complete cadastral map and an accurate record of titles. The survey of estates is carried out by the village accountants. The method now adopted in all plains tracts is that known as the square system of measurement.

¹ *Abadi*.

² *Jamabandi* (Appendix VIII).

³ *P.A.R.* (1923-24) 130.

⁴ *Sihadda*.

⁵ *P.A.R.* 131.

Before the plotting of the fields is commenced, the whole area of the estate is carefully marked out into squares of equal size, and the field map is filled in by plotting the distance of the corners of the fields from the sides and diagonals of these squares. It is found that the village accountants lay out the squares with fair accuracy, and the resulting field map is correct enough for all the purposes of the revenue administration.¹

Since the districts which were mapped on the square system have begun to come under Remeasurement or revision of maps. Settlement, the process of map correction has become general, and has, at the same time, been simplified. Unlike remeasurement it does not necessitate any great temporary augmentation of the regular village accountant² staff of the district. A strong supervising staff is, however, still necessary in order to keep pace with the village accountants, who turn out work much faster than at remeasurement. But the work as a whole is completed more expeditiously, and the more modern Settlements are both shorter and cheaper,³ though less accurate, than those which preceded them. The duty of deciding on the extent to which remeasurement is required now falls on the Assistant Settlement Officer, who acts as harbinger to the Settlement itself.⁴ The field maps should be not only accurate enough for revenue purposes, but also (when their scale has been reduced) capable of being utilized for topographical purposes by the Survey Department. Once accurate maps have been made, no re-survey is necessary in tracts unaffected by the action of streams or the spread of ravines, except where great extensions of cultivation and changes in field boundaries have taken place by the introduction of canal irrigation.⁵

Before land can be assessed it must be classified in accordance with its revenue producing capacity. Classes of land and soils. In a country like the Punjab, where there is hardly ever enough rain, the most important classification is that founded on the source from which the moisture

¹ P.A.R. 251.

² Patwari.

³ S.M. 86A.

⁴ Para. 168.

⁵ S.M. 263.

Required for the growth of the crop is derived. Thus land may be dependent on rainfall alone,¹ or on flooding or percolation from river or canal² it may be watered by lift from tanks, lakes³ or streams,⁴ or irrigated by canals⁵ or wells.⁶ Less important are soil distinctions based on the use of manure or the course of husbandry, though the block of land lying immediately round the village site on which the sanitary methods of the inhabitants bestow a continuous fertilization of nightsoil, is sometimes separately classified⁷ by Settlement Officers.⁸ Discrimination is also occasionally made in unirrigated lands between clay,⁹ loam,¹⁰ and sandy¹¹ soils.¹² The desirability of such discrimination depends on local circumstances. All that can be said is that the classification should be as simple as possible and be based on broad differences of a fairly permanent character which affect in marked degree the economic rental of the land. The test to be applied to it is its sufficiency for practical purposes, for, as has been well remarked, a "Settlement Officer must remember that he is a land valuer, and not a mineralogist."¹³ Uncultivated land is classified as unculturable¹⁴ when, as in the case of rocks or roads cultivation is impossible, or as new,¹⁵ or old fallow,¹⁶ according as it has, or has not been cultivated within the last four harvests.¹⁷

Assessment
 Circles.

A Settlement Officer making a general survey of one of the sub-montane districts may find below the hills a rough country seamed with ravines. As he marches southward the uneven land may pass gradually into a wide plain of good easily-worked loam, to be succeeded in its turn, perhaps, by stretches of stiff clay. On one side the plain may drop abruptly, or in a large slope of broken land, into the valley of one of the great rivers, part of which may now

¹ Barani.

² Sailab.

³ Jhil.

⁴ Abi.

⁵ Nahri.

⁶ Chahi, S.M. 259.

⁷ Gora or Lipara.

⁸ S. M. 261.

⁹ Dakar or Rohri.

¹⁰ Rausli or Maira.

¹¹ Thur or Tibba.

¹² S. M. 262.

¹³ S. M. 265.

¹⁴ Ghair Mumkin.

¹⁵ Banjar Jadid.

¹⁶ Banjar Qadim.

¹⁷ S.M. 267.



be beyond the reach of ordinary floods, while the remainder is subject to all the vicissitudes of fortune which the vagaries of a Punjab river involves. The plain above the valley may be scored with hill torrents, whose sandy beds are dry in the winter. Such torrents will leave rich loam in one place, and barren sand in another, till finally, when all the good silt has been lost, they will render the flooded land stiff and intractable with deposits of fine mud. Thus, both in the hills and the plains, the valley bottoms may present a great variety of soils, whose rapid changes in fertility from year to year and from place to place are exceedingly perplexing to an Assessing Officer. At a distance from the hills these changes are more gradual, but they exist nevertheless; while differences of rainfall and in the depth of subsoil water also produce corresponding differences in methods of cultivation. These variations in soil and climate are reflected in the varying health and energy of the people, differences which are often accentuated by the unequal aptitude for agriculture displayed by the different agricultural tribes, as a result of their past history. To these differences of soil, climate, and character, must be added those due to the introduction of canal irrigation, which all combine to produce notable variations in the agriculture of the different tracts.¹

Thus, no set of rates could be devised which would be of any use in assessing all the villages of a district. Separate assessment proposals are accordingly made for each *tahsil*, each *tahsil* being again divided up by the Settlement Officer into more or less homogeneous blocks, the estates in each of which have, whatever their individual peculiarities, a strong general likeness as regards the chief factors affecting the value of land. Such blocks or groups of villages are known as assessment circles.² This does not imply, that the revenue of each village must be the exact product of the application to its lands of the sanctioned circle rates. The general similarity which will admit of a single set of rates as a guide is quite compatible with differences leading in

¹ S. M. 300.

² S. M. 301.



the case of individual villages to a greater or less divergence from them in actual assessment. But such a deviation must be justified by reasons to be recorded in the village Note Book, and if it amounts in any estate to as much as 20 per cent. the Settlement Officer must give a special explanation of the divergence in the detailed village assessment submitted to the Financial Commissioner.¹

Having thus broken up each tahsil of the district into economically homogeneous assessment circles, and having classified the different soils in each circle, it remains to consider what standard shall be applied in fixing the rates of assessment of each class of soil in each circle and village. This standard of assessment has undergone considerable variations. Under the original indigenous system a share of the produce was taken as the revenue of an estate. This method has the advantage of elasticity, the amount assessed fluctuating with the quality of the harvest. But it may readily be imagined that the collection of revenue assessed in this manner caused much friction and was attended by much dishonesty. In order to avoid loss the State in some cases entrusted the collection of its land revenue to local magnates. The result of this was that these magnates squeezed as much as they could out of the people, and paid as little as they dared into the coffers of the State.

The fixed assessment, which was introduced by the British,² did away with all these abuses, and had obviously great advantages. Under this system a rough average was struck of the value in cash of the share taken by the State in previous years, and the amount thus calculated was fixed as the assessment to be levied from an estate every year for a definite term of years. Unfortunately this system proceeded on the assumption that the peasant would be able to save in a good year enough to meet the losses of a bad year—an assumption which was not warranted by the facts. The original summary fixed assessments of the Province, which were based on figures obtained

¹ S. M. 302.

² There had been fixed assessments before, but they were not usual. (See *L.F.R. passim*).



From assessments in kind actually collected in Sikh times, were for this reason in many cases found to be too high and had to be reduced at the time of the subsequent "regular" settlements. About the same time it was decided that it would be fairer to the land owner to take from him a share of his net rather than of his gross assets.¹ Obviously it would be unfair to take in all cases the same fraction of the gross produce. Two plots of land of equal size may yield exactly the same amount of wheat; but in one case the crop, favoured by a fertile soil and an abundant rainfall, may be raised at the cost of little labour and money, while in the other it may be the result of laborious tillage and the expenditure of capital on deep wells and the costly cattle required to work them. Native rules met the difficulty in a rough and ready fashion by varying the share of the produce demanded according to the character of the soil and rainfall and sometimes by allowing special exemption in the case of wells.

The same result is now reached by making the standard of assessment a fixed proportion, not of the gross produce or gross assets, but of the "net produce" or "net assets." This last phrase is defined to mean "the average surplus which the estate may yield after deduction of the expenses of cultivation. A full fair rent paid by a tenant-at-will, though sometimes falling short of the net assets, may, generally, be taken for practical purposes, as equivalent to the net assets. The net assets also include any income which the proprietors derive from the spontaneous produce of their waste and cultivated lands, and, strictly speaking, any dues of whatever sort which they get in their capacity of land-owners."² The actual share of the net assets taken by the State under the British was gradually reduced from five-sixths to a half.³ In process of time this one-half net assets was treated, not as the average revenue, which might be taken, but as the maximum limit of the assessment, which might be made.⁴ A further limitation in the amount of assessment arose from the practice of limiting increases on the old assessment to $33\frac{1}{3}$ per cent. a practice which

¹ A.C.M. 19-20.

² S.M. 308.

³ S.M. 309, L.F.R. 263.

⁴ A.C.M. 20.

(except where conditions have been changed by the introduction of canal irrigation) has now been made legally binding by a Legislative Council, in which the landlord's interests predominate. This Council has also extended the interval between re-assessments from a period of 20 or 30 years to a normal minimum of 40 years, and reduced the standard of assessment from one-half to one-third of the net assets.

The net assets estimate must be founded on a careful analysis of existing rents. This will disclose what is the normal rental of each class of land for which it is proposed to frame a separate revenue rate. All rents which are obviously of a favourable character, such as those paid by occupancy tenants, or rents whose very form suggests that they are purely customary, as when a tenant-at-will pays the land revenue with the addition of a small proprietary fee, must be excluded from the calculation.¹ Cash rents are exceptional, rent being commonly paid in the form of a definite share of the grain on the threshing floor,² or in the case of crops such as sugarcane, cotton, opium, tobacco, vegetables and fodder, which cannot conveniently be so divided, in the form of fixed rate per unit area³ of each crop.⁴ The estimate based on such rents is sometimes called the produce estimate, as the framing of it involves an attempt to determine the money value of the whole yearly produce of the tract under assessment.⁵ It is based on calculations of the average acreage of each crop on each class of land for which it is proposed to frame separate rates, the average yield per acre of each crop so grown for which rent is taken by division of produce, the average price obtainable by agriculturists for each crop and the actual share of the gross produce received by land owners.⁶ The results obtained are vitiated by the fallacy underlying agricultural statistics of outturn.⁷ "Little reliance is placed on them in practice by Settlement Officers,"⁸

¹ S.M. 311.

² Batai S.M. 312.

³ Kanal or Bigha, See Appendix XVIII.

⁴ Zabt.

⁵ S.M. 315.

⁶ S.M. 316.

⁷ P. 163, Appendix XVI, L.F.R.264.

⁸ S.M. 357. This frank confession by that paragon amongst the Settlement Officers, Sir James Douie, is very remarkable.



who do not hesitate to cook them when necessary so as to bring them into conformity with the results obtained by what are known as "general considerations."

The enquiry which is concerned with what are vaguely General Con- termed "general considerations"¹ ignores siderations. the net assets standard, and confines itself to the question of securing to the State the highest revenue which is compatible with the prosperity and contentment of its subjects and the continued extension and improvement of cultivation.² This involves a study of the fiscal history of the district³ with particular reference to the character of the assessment under revision⁴ at the time, and especially its distribution over estates and holdings.⁵ Where estates are prosperous and the land revenue has been paid without difficulty it may be inferred that it has not been unduly severe and that an enhancement is possible, provided that there has been an increase of cultivated area and of means of irrigation, an improvement in markets and means of communication, and *above all* a rise in prices. Other matters for consideration are the capacity for agricultural development of each estate due to any surplus land or irrigational facilities or the extra wealth or energy of the inhabitants.⁶ The general conclusions which are arrived at after a preliminary tour of the district are confirmed or modified at the special inspections of each estate which the Settlement Officer is required to make before he recommends assessment rates for the different assessment circles. In practice the "proper channel" through which the recommendation goes is so choked with silt that most Settlement Officers make their recommendations after a limited number of village inspections, leaving the remainder to be completed afterwards. The terse village notes (recorded in the abstract village note book)⁷ in which Settlement Officers have recorded the results of such enquiries are often brilliantly concise summaries of the rural economics of each village,⁸

¹ L.F.R. 264.

³ S.M. 361.

⁵ S.M. 363.

⁷ p. 197.

² S.M. 360.

⁴ S.M. 362.

⁶ S.M. 364—72, 378, 380, 382, 408.

⁸ S.M. 421.



and from these it can be inferred how far the circle assessment rates shall be modified in the case of that village. When the village assessment is announced the village community has the right first to petition the Settlement Officer to revise his order, and, if still dissatisfied, to appeal to the Commissioner, whence lies a further petition for revision to the Financial Commissioner, the highest revenue authority.¹

In the south east of the Province, where cash rents are common, they form a less fallacious guide to the "net assets" than the pseudo-scientific produce estimate. In other parts of the Province, too, they now exist in sufficient quantity to be used as an assessment guide, and where this is the case they furnish evidence of the landlord's net assets and of the relative assessable values of different classes of land more direct and certain than any that can be drawn from rents which fluctuated with the amount of grain harvested.² Their increased value as assessment guides is not only due to the increased area in which they prevail, but also to improvements in the method of recording them.³ But here again the varying fertility of agricultural land renders futile all attempts to attain an average rent, especially where (as is often the case) all soil distinctions have been given up, which are not based on the presence or absence of irrigation. Moreover, not only does rent vary with the quality of soil, but the very meaning of the word "rent" varies from place to place. Sometimes it denotes the amount that a rack-renting landlord can extort from peasants who have nowhere else to go, and sometimes the nominal fees taken by an easy-going gentleman from relations or dependents.⁴

All village and town sites of ancient standing are exempt from assessment, but this rule does not apply to those modern extensions of old towns which are rapidly becoming more important than their ancient nuclei. The assessment in such urban areas is far

¹ O'Dwyer 55.

² S.M. 344.

³ S.M. 86 B.

⁴ S.M. 346—53.

in excess of the highest arable assessment, though it is still a much smaller proportion of the economic rent than is assessed on agricultural land. The assessment on new town and village sites in the Canal Colonies and elsewhere is, however, very much heavier, so heavy that in Sheikhpura the lawyers used all the weapons of legal chicanery to avoid paying it.¹

The fixed assessment imposed by the British was gradually rendered more elastic by a provision that any part of the amount payable annually might be suspended and subsequently remitted in unfavourable seasons. Even so, it was found that there were parts of the Province where the fixed assessment proved unworkable. Such an assessment may absorb but a small share of the gross produce of the land assessed, but it must be paid out of the net produce, so that in the case of inferior land a substantial deficiency in the outturn may leave no net produce whatever, with the result that (in the absence of savings) the assessment can only be paid by borrowing or by stinting the necessities of life. When such a deficiency is frequent the rigid demand of the land revenue adds very materially to the hardships endured by a poor and uneducated people.²

Accordingly, in areas where conditions were precarious, systems of assessment were introduced according to which the land revenue was assessed on the crops grown each harvest. These (so-called) fluctuating systems of assessment were also found necessary in riverain tracts where the crops are dependent on river floods, the extent of which varies greatly from year to year. They were at first unpopular with the people and were not greatly favoured by Government, as they had the great disadvantage of placing power in the hands of subordinate officials. They arose, however, almost inevitably as a development of the special revenue law applied to riverain areas. The great rivers of the Punjab plains, after penetrating some way from the

¹ S.M. Appendix XV.

² Taxation 87.

hills, flow usually through a wide valley, bounded on either side by old banks or by broken land with a strong upward slope. These banks or slopes indicate the extreme limits of the wanderings of the stream. The valley is seamed with channels, some dry all the year round except in heavy floods, some dry in winter and flowing in summer, and some containing water throughout the year. The main channel ¹ gradually gets silted up, and the force of the stream is diverted into some other bed, which in its turn becomes the principal one. This shifting of the stream from one bed to another may leave much of the land between them unaffected. ²

The extent to which "clear and definite" and "immemorially established" local usages as to the effect of river action on property in land existed in the Punjab at the time of annexation seems open to doubt. Where disputes arose probably victory was generally to the party which could muster most clubmen, or could pay the biggest bribe ³ to the ruler of the day. ⁴ Generally, however, the rule prevailed that the deep stream formed the boundary between estates on the river banks, ⁵ subject to the qualifications that the transfer of land in an indentifiable state by avulsion from one bank of a river to another involved no change of ownership. ⁶ This rule has now, however, been nearly everywhere replaced by boundaries fixed so as to put each party in as good a position on the whole as he would have been, taking a long series of years together, if matters had been allowed to continue under the existing ⁷ law or custom. In this way not only have the boundaries of estates been fixed, but, in the majority of cases those of private property also. ⁸

The action of the seven great rivers of the Punjab, Riverain and of the numerous torrents which issue from assessments. the hills, leads to wide variation in the productive capacity of the estate on their banks. It was, therefore, imperative that there should be some means by which the land revenue demand of such villages could be revised from time to time. In many places the changes caused by the

¹ *Dhar kalan.*

² *L.A.M. 411.*

³ *Nazrana.*

⁴ *L.A.M. 417.*

⁵ *L.A.M. 418.*

⁶ *L.A.M. 419.*

⁷ *L.A.M. 422.*

⁸ *L.A.M. 423.*

rivers were so frequent and so extreme that the only solution was the abandonment of a fixed assessment altogether in favour of a fluctuating one, which involved the reassessment of the whole demand harvest by harvest. But elsewhere the fluctuating system was limited to the actual areas washed away or silted up by river action. This latter system prevailed throughout the Province for many years after annexation, and it is still in force in a large part of it.¹ The main feature of such assessments is the division of the land into two or three classes, for which separate rates are fixed, the class to which any particular field belongs being mainly determined by the crops grown in it. A light rate is also generally imposed on uncultivated land which is fit for grazing.² But however perfect the system on paper, its practical working depends on the efficiency of the subordinate revenue staff. These latter need close supervision by the superior revenue staff of the district, a supervision which³ has been sadly lacking in recent years.

There was a tendency in some of the older Settlements to over-assess riverain tracts. Cultivation was then backward in the more arid up lands, and the refreshing green of the river valleys was sometimes taken as a sign of abounding fertility. As a matter of fact riverain tracts are as a rule weak tracts. The caprices of the river import into agriculture so large an element of chance that good farming is discouraged. At seed time the soil may be so wet that it cannot be worked up to a proper tilth, weeds are very troublesome, and an untimely flood may rot the ripened crops or sweep away the grain from the threshing floor. The climate is often bad, and for one reason or another the landowners are frequently spiritless and thriftless. Even the men of hard working tribes, who thrive elsewhere, are sometimes in a chronic state of debt and difficulty when their lot is cast near a river bank.⁴ Moreover, the value of the silt carried in suspension by the rivers of the Province, varies immensely, and the nature of the deposit left, when their floods subside, differs in different parts of the course of a

¹ L.A.M. 438.

³ L.A.M. 441

² S.M. 455.

⁴ S.M. 456.

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stream and also in the same part in different seasons. Changes in the channels of many rivers take place year by year, cultivated lands are swept away or slowly sucked into the river bed, while elsewhere fresh land is being exposed. Hence riverain¹ land is in quality both varied and variable, good and bad soils being often found close together, and land which is fruitful in one year becoming a sandy waste the next.² Consequently the assessment of riverain land in different parts of the Province varies considerably. Along the upper reaches of the Jumna, where the rainfall is copious and the river deposit sandy, flooded land has been rated much below land dependent only on the rainfall; while on the other hand, the combination of rich silt and a scanty rainfall has led on one part of the course of the Jhelum to the riverain¹ rate being pitched higher than that on land irrigated by wells.²

The success of these fluctuating assessments in riverain areas suggested their application to the large tracts of State lands brought under cultivation by Canal irrigation in the Central Punjab. These waste areas were leased and sold to colonists from all over the Province, and when they were brought under cultivation it became unnecessary to assess them to land revenue. The fixed system of land revenue could not be applied in the beginning, because conditions were in a state of flux and the areas cultivated varied greatly from year to year, the variations being all in the direction of a great increase. The charge for Canal water used for irrigation had always been by a rate varying with the kind of crop grown, applied to the actual area under that crop. This necessitated a field-to-field examination and measurement, and was, in fact, precisely the same as the fluctuating system of land revenue assessment applied to riverain areas. Thus the fluctuating system of assessment, which was originally intended for precarious tracts only, was extended to areas which have since become the most fertile tracts of the

¹ *Sailab.*

² *S.M.* 453.

³ *Chahi S.M.* 454.

Province. There has been a great increase in canal irrigation of State lands in the twentieth century with a resultant increase in the importance of fluctuating assessments, so that the actual amount of land revenue assessed under the fluctuating system amounted in 1926 to over four-ninths of the total land revenue of the Province.¹ In the districts, however, watered by the older canals², where irrigation has become well-established, the extra profits which the landowner derives from irrigation are assessed by a light fixed demand, and not by an acreage rate on the area irrigated from year to year.³ In many parts of the Western Punjab the fluctuating system of assessment has also been applied to those broad tracts, where the scantiness and capriciousness of the rainfall render extremely precarious the unirrigated cultivation, on which they depend,⁴ but so far it has not been extended to the similar tracts of the south-east.

The burden of the land revenue is slightly enhanced by the addition of cesses, which are levied at so much per cent. on the land revenue. The claims of the State to half the net assets as land revenue is not affected by the levy of cesses, and no man has a right to have his assessment lowered because it and the cesses together absorb more than one-third of the economic rent. But where holdings are small and the margin left after providing a bare livelihood for the land owner and his family is usually slender, the fact that a large sum is paid on account of the cesses, and that it increases *pari passu* with the increase of the land revenue may undoubtedly limit the amount of enhancement which can prudently be taken.⁵ Foremost among these cesses comes the headman's surcharge, which as its name⁶ implies, amounts to 5 per cent. on the land revenue. A further cess of about 10 per cent. known as the local rate, is levied to finance the District Board, the organ of local self-government in a district.

¹ A.C.M. 21-2.

² Western Jumna Sirhind and Upper Bari Doab.

³ S.M. 86 B. ⁴ S.M. 472. ⁵ S.M. 365.

⁶ Pachotra.

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Of a different nature is the village cess levied to provide the common fund¹ of the village, into which the common income of the village community from all sources is paid, and out of which its common expenses are met. The receipts and disbursements are usually entered in the books of a village shopkeeper and the expenditure managed by the headmen, but the right of any landowner to demand an account is generally recorded in the village administration paper.² In practice, however, this right is now seldom exercised, and the common fund is managed and often embezzled by the village headmen. Into the common fund are also paid the cesses, which the landowners themselves realize from the other residents in the village, or from particular classes of residents, or from persons making use of the village lands. These cesses are really in their origin seigniorial dues, levied in primitive societies where certain classes are dependent on others for protection. Essentially, therefore, they are property just as much as the income directly derived from the land.³

The raising of the period between Settlements to Progressive 40 years has one incidental disadvantage. assessments. "A tax based on the income of the year is met out of it and forms part of the family budget and standard of living. One that is changed once in a generation, and which is in many cases amortised, does not make itself felt in the same way, and when the change does come, if it is in the direction of increase, it is felt as a serious hardship."⁴ "To soften the effect of a large enhancement and mitigate the loss to the State which a long term settlement may involve, resort has sometimes been had to progressive assessments. By this plan the full amount of the new demand is announced to the landowners, but the actual collection of part of the increase is deferred for a few years. If a breathing space is given it should not be too short. The initial demand should hardly be raised till it has been in force for five years, and, if the full revenue is to be reached by two steps, the second

¹ Malba or Dharat.

³ S.M. 94.

² S. M. 93.

⁴ Taxation 87.



may be taken after the lapse of another five years.¹ There is another kind of progressive or deferred assessment, as to the grant of which a Settlement Officer has no choice, namely, that prescribed for the protection of certain classes of improvements carried out at the cost of the landowner. For the ruling power to preclude itself from claiming a larger revenue from the land because its produce has been increased by the expenditure of the capital and labour of the occupiers is impracticable and opposed to immemorial usage. The State may be likened to an influential sleeping partner who has given to the other partners the right of managing and developing the property, but has not cut himself off from sharing to some extent in the growth of the receipts due directly to their enterprise, but indirectly also to his moderation and power of securing to his associates the peaceable enjoyment of the fruits of their industry. Justice and policy certainly demand that they should be guaranteed a fair profit on their expenditure, but no villager dreams of complaining that his fields are not assessed at their prairie value, or that well lands are rated higher than unirrigated soils.² To prevent undue hardship, however, there are rules exempting improvements from assessment for a period of years, the land irrigated by wells, in particular, being exempted from extra assessment till the well has been twenty years in use.³ Apart from this the tendency is now to lay on such improvements a much lighter assessment than formerly.

The total assessment of each circle having been determined, it remains to distribute it over Closing operations of the Settlements. villages⁴ and then again over holdings.⁵ It then remains to determine how the revenue can most conveniently be collected. The arrangement made should be that which is most convenient to the people, and which by requiring payment when they have most cash in hand allows them the amplest facilities for escaping from the money-lender.⁶ Where an equal division of the

¹ S.M. 495.² S.M. 501.³ S.M. 505.⁴ S.M. 518-23.⁵ *Bachh S.M.* 524 45.⁶ S.M. 555

demand between the summer and winter harvests is not suitable, some simple fractions, such as one-third and two-third, should be adopted.¹ The dates fixed for payment in each case should be late enough to give the owners full opportunities in an ordinary year of disposing of enough of their grain to pay the revenue with its proceeds by the time it falls due. But they should not be so late as to offer any temptation to them to squander the fruits of the harvest or hand them all over to the village money-lender. Crops can be roughly divided into those which a farmer keeps or would like to keep for the food of his family and his cattle, and those which he grows for sale. It is the time at which the latter are garnered that must be chiefly considered.²

The final objective of a Settlement is the Settlement report. It is by the literary merits and the plausibility of this that a Settlement Officer's work is judged, rather than by the inaccuracy of his revision of the land records, which is only slowly revealed to subsequent Deputy Commissioners in the resulting litigation and strife.³ This is supplemented by a hand-book for the guidance of district revenue officers in carrying out the provisions of the Settlement.⁴ Having sung his Nunc Dimittis, the Settlement Officer then transfers all his papers and correspondence to the District Office to await its resurrection thirty or forty years later at the time of the new Settlement.⁵

The harassment which a Settlement causes to the people of a district, and the disorganization, which ensues to the administration generally, justify a consideration as to whether the results achieved justify all this pother. Land revenue (in India at the present time) may best be defined as a tax on incomes derived from agriculture, and there is no reason why the ordinary canons of taxation should not be applied to it. For too long has the scientific sham of the produce estimate served to give a false air of verisimilitude to methods which

Suggested
 Reform of
 Settlement
 Procedure.

¹ S.M. 556.

² S.M. 556.

³ S.M. 550.

⁴ *Dastur-ul-amal* S.M. 550, A.

⁵ S.M. 549.



are in their essence empirical. Once the sacrosanctity is broken down, which the dust of ages has given to the Settlement ceremonial, it can be seen that more accurate results could be obtained by simpler methods. One of the most important elements in taxation is the general level of prices. But improved communications have done much to stabilise prices throughout the province, and it should not be difficult to devise a machinery by which a permanent rise (or fall) of prices exceeding (say) 25 per cent. should be followed by a proportionate rise (or fall) in the land revenue. Once this vital change in taxable capacity had been allowed for, all other changes could be ignored except those due to the introduction of canal irrigation. This could be sufficiently allowed for if (as has been suggested) the irrigation authorities would tax the water supplied, and not the land irrigated. It would then be only a matter of arrangement as to what proportion of the charge for water should be credited to land revenue. Any further increase in land revenue required could be obtained from a super-tax on large agricultural incomes, and an export tax on commercial crops such as wheat and cotton. This method would ensure for the small peasant proprietor, who is hardest hit by Settlement methods, a permanent Settlement varying only with marked changes in prices. Apart from this any increase in agricultural taxation would fall on the user of canal water, the large land-owner, and the commercial classes, *i.e.*, on those best able to afford it. Above all this would save the peasantry from the depredations of the army of parasites which now descends on them at every Settlement; for the revision of maps and records could be far better carried out by the ordinary revenue staff (slightly amplified) working as it would with a sense of responsibility quite foreign to a staff which reckons on leaving the district once the Settlement is completed.



CHAPTER III.

LAND AND WATER.

1. OLD METHODS OF IRRIGATION.

Plough deep for the autumn sowing, then pray for the spring-tide grain.

For your bullocks may plough till they drop, yet the fruit of their toil may be vain.

For what is the profit of ploughing, if ALLAH withholdeth his rain ?

Punjabi Proverb.

Behind the normal happy life of the early village community lurked the ever-threatening spectre of famine. The word famine now connotes a work-famine when it is difficult for the peasant to obtain the means to pay for food ; but in the famines of pre-British times, food was so unobtainable, that men and women were driven by hunger to eat human flesh. The sale of children into slavery marked the first stage of such a famine, cannibalism its climax. And the horrors of famine were followed by those of the pestilences which carried off the weakened population in thousands. These famines were the inevitable accompaniment of economic conditions which left the bulk of the people dependent on the soil for their means of livelihood. They were particularly severe in tracts like the Punjab, with a precarious rainfall, where years of plentiful harvests were succeeded by periods of continued drought, in a country of small peasant proprietors without any capital, living for the most part from hand to mouth, amongst whom credit ceased to exist as soon as the rains failed. Moreover the bad condition and insecurity of the roads and the levy of vexatious transit and customs dues prevented the exportation of grain to any distance, and the people of the one tract starved for food while plenty reigned in neighbouring



districts. The development under the British of communication by road and rail removed the possibility of such localised famines. But it was by the construction of a great irrigation system with the resultant surplus of wheat available for export in good, and as a food reserve in bad years that the British finally removed the ever present dread of famine. "Famine no longer finds the people at its mercy" and where there are no canals "the railway brings relief. Food can be poured in from more prosperous areas, and, if there is no money to give in exchange it can be earned on relief works, or, at the cost of a modest ticket, work can be sought in towns where labour is always in demand. Man at least need no longer starve. The problem now is to save his beast."¹

"Famine to-day, therefore, though due primarily to local failure of crops and failure of the local supplies, is not due to actual shortage of the essential food, but to the absence in the general population of the capacity to buy the food that is there. Famine relief is no longer afforded by the supply of grain, the ordinary trade channels are capable of supplying all that is required, it takes the form of the provision of employment by which those out of work are enabled to earn the money necessary to purchase the grain which is there."² But as such relief is now as much a part of the ordinary business of the State as poor-law relief in England, a sinking fund (called the "famine insurance grant") sufficient to meet the probable expenditure over a series of years is provided in the Provincial budget.³

"An adequate supply of soil water for the plant is the first condition of success in crop-production. Irrigation. Without this the plant cannot make full use of the natural fertility of the land. Hence the dependence of the crops of India on the monsoon and the importance of a well-distributed rainfall to the country. The monsoon is the dominant factor in rural India. The well-known uncertainty of the monsoon produces other effects besides

¹ *Darling* 92-3.

² *Agricultural Practice* 206.

³ *Holderness* 152, p. 104.



limiting the annual harvest. The character and outlook of the population have been affected. The people feel that the monsoon is in command. The villager is convinced that he has to accept what Providence has seen fit to provide. Hence the well-marked fatalism of the people, the general stagnation of village life and the absence of any desire on the part of the cultivator to improve his condition. Anything approaching a high morale cannot therefore be expected under such conditions. Considerable progress has, however, been made in removing the worst consequences of an irregular rainfall. The surplus water running to waste in the great rivers, notably those of the Indo-Gangetic plain, has been led to the fields of the cultivators by a network of perennial and inundation canals. All over the country the large supplies of subterranean water are tapped by means of wells and raised to the surface, chiefly by cattle power.”¹ In 1926² the total cropped area of the Punjab (36·1 million acres) was made up of 16·1 million acres unirrigated, 9·5 irrigated by Government canals, 5 by private canals, 3·6 by wells and 1 by tanks and other sources. The total canal irrigated area has been steadily rising. In 1893 it was only 3 million acres, it rose to 6 million acres in 1901 and remained fairly stationary till 1908, since when with the expansion of the Triple Canal system it rapidly rose to 10·3 million acres in 1920-21. In 1922-23 it reached a record of 11·5 million acres, but in 1923-24 the area irrigated fell slightly to 10·8 million acres, and equal area being again irrigated in 1924-25.³

Irrigation of a sort has been practised in the Punjab from the earliest times. In the hill tracts of the north-west, the south-east and south-west, the water which occasionally rushes down in torrents after a burst of rain, was restrained and spread over the fields as required. The value of such embankments not

¹ *Indian Agriculture* 11-12.

² I have taken the average of the figures for the agricultural years 1925-26 and 1926-27 as given in the Season and Crop Reports.

³ *P.A.R.* (1924-25) 25.



only for irrigating the land above them, but also for protecting the land below them from the depredation of torrents is now being increasingly realized. In the Kangra Valley these embankments are arranged in tiers along the contour lines of the hills, thus retaining the water so that rice, a semi-aquatic crop, can be cultivated.¹

The embankments² in the Gurgaon district have had a long history. In former times, under native rule, considerable areas were irrigated by dams thrown across streams in the hills, thus flooding an expanse of country. Under British rule, these works were placed in charge of the Irrigation Department, under whose management many of them were allowed to fall into disrepair on account of the small direct revenue derived from them. In 1879, however, they were taken over by the District Board. The system was subsequently greatly extended, and as much attention paid to the prevention of swamping as to the development of irrigation. This arrangement did not work well, as in dry seasons the income from these embankments fell away to almost nothing and the resources of the Board were unequal to the expense of maintaining them in an efficient condition. For this reason it was decided to provincialise them, and in 1910 they were placed under the direct control of the Deputy Commissioner, who managed them with the assistance of such a particularly incompetent District Engineer, that the whole system proved unsatisfactory and had to be carefully re-examined. Situated as they were in out-of-the-way corners of the district, these embankments required an attention which they seldom received. Many had fallen into such a state of disrepair that not only did they not assist irrigation but they constituted a menace to the district. Their temporary transfer to the expert control of the Drainage Board was inevitable. A special staff was appointed to repair dangerous places, take levels and prepare the data necessarily required before the policy to be adopted in future could be determined. The Board will now complete

¹ *Indian Agriculture* 12.

² *ibid.*

a contoured survey, restore the embankments to a workable condition and formulate a plan for their future maintenance.¹ This should provide an embankment for every small water channel,² and a ladder of embankments all down the course of every big drainage line. "In this way only can the rain water from the hills be turned to profit instead of, as at present, eroding the country, spreading sand on the fields and flooding large areas of land."³ But there is no reason why the organized water-control which the energy of Mr. Brayne has introduced into the Gurgaon district should not be applied to all the submontane districts, where the deforestation of the hills combined with the lack of embankments in the plains is rapidly transforming a garden of Eden into a sandy desert.⁴

The rice grown in the terraced embankments of the hills and submontane areas is irrigated by small Water Channels. channels,⁵ taken out of some river or stream and often carried along the contour lines of the hill sides till a point is reached whence the water can be discharged on some cultivated area.⁶ Such irrigation works date mainly from pre-British times, when they were almost always constructed by the joint action of the peasantry and of the ruler or his representative or assignee. Most of the work was done by the unpaid labour of the peasantry and their dependents, but the ruler supplied direction and driving power and often paid labour, occasionally feeding the gangs of unpaid labourers while at work. Irrigation works constructed in this way may be said to have been the joint property of the State and the cultivators, and their maintenance continued to be the joint concern of both partners, the actual labour being ordinarily supplied by the cultivators of the State usually only assisting in the enforcement of united action, and occasionally expending money on critical occasions. For this purpose the powers of the State were exercised through the revenue officials as part of the ordinary

¹ P.A.R. (1923-24) 120.

² *nullah*.

³ *Brayne* 50.

⁴ A.C.M. 78.

⁵ *Kuhl*.

⁶ P.A.R. 300.

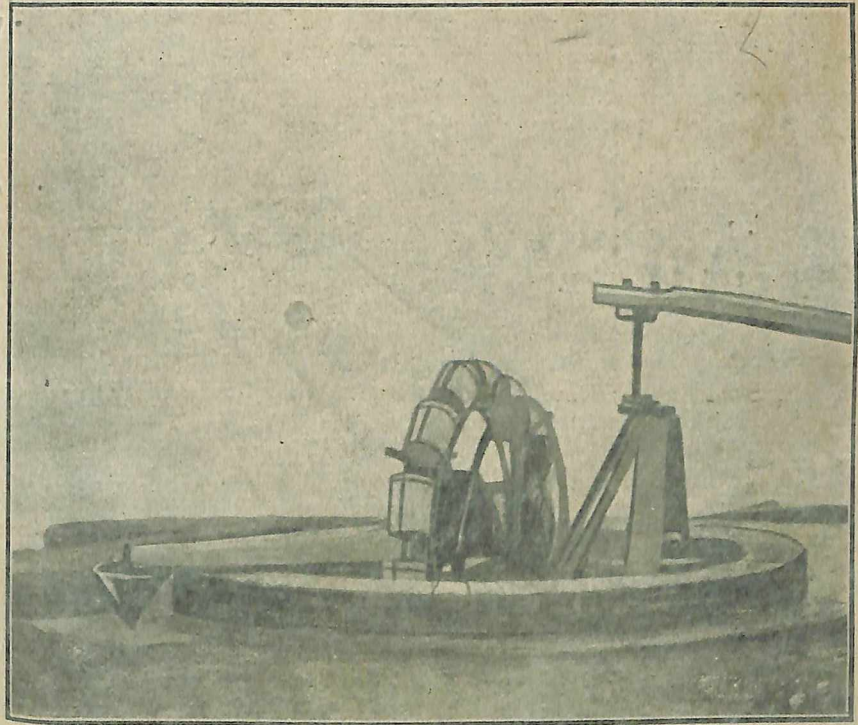
LAND AND WATER

revenue administration of the country. Sometimes, however, subordinate canal officials were appointed for the purpose and paid by a special cess imposed on the irrigators.¹ The successive rights to take the water, and the time during which it is to run on to each lot, the dams to control it, and their maximum height are all regulated by custom,² and such customs are still recorded in the village administration papers.³

But these methods of irrigation have never been of great importance. Even now they only irrigate Wells.

1 million acres, while no less than $3\frac{1}{2}$ million acres are irrigated by wells, the most important indigenous and still an extremely efficient instrument of irrigation, the number of wells in the Province having risen from 245,000 in 1911 to 290,000⁴ in 1926. If a well be sunk anywhere in the Punjab plains it will find water within at most a hundred feet or so of the surface, and will refill to that level after pumping. The surface below which the subsoil is saturated sufficiently to fill a well is known as the water-table. This water-table is continuous, and has a gentle gradient in the direction in which water is flowing. It is fed by downward percolation from rainfall and other sources of moisture at the surface, and flow has to take place from these points to where the water-table is lower, and to outfalls.⁵ If too many wells are sunk in a given area the water-table is lowered and the area as a whole gets no additional water from fresh wells. This limit is being rapidly reached in some of the submontane areas, where well irrigation is most prevalent, lying as they do between hill districts to the north where there is sufficient rain for unirrigated cultivation while to the south the water-table sinks and renders well irrigation more difficult.⁶ In the uplands of Jullundur and Ludhiana districts the coarser food grains and the fodder crops are raised on the rain lands, and the well areas

¹ S. M. 443 quoting Sir James Lyall. ⁴ Of these only 270,000 were made of masonry.
² L.S.B.I. Vol. I. 14. ⁵ A.C.M. 79.
³ *wajib-ul-arz.* ⁶ P.A.R. 299.



Persian Wheel (improved type with aluminium buckets).

are devoted to fine crops of wheat and maize, cotton and sugarcane. In years of average rainfall no attempt is made to spread the water over a wide surface, from 10 to 20 acres being thought enough to irrigate in the two harvests. In areas of heavier rainfall the climatic conditions lead the people to annex to each well a far larger area in the hope that, with favourable rains at sowing time, the increased acreage may more than compensate for any diminution in yield. Where the rainfall is scanty, the wells have to produce even the food for the cattle that work them. In the south-western districts, where rain is almost unheard of, wells require to be supplemented by river water coming naturally by overflow, or brought through artificial channels on to the land;¹ while in the desert² between the Indus and the Jhelum the wells can at times only supply drinking water for camels and human beings.

“Irrigation from wells is in the main carried out by means of the Persian wheel.³ This consists of a large drum,⁴ over which passes an endless rope ladder⁵ with miniature buckets attached to it at distance of one or two feet. The rope-ladder with buckets reaches below the surface of the water in the well. The drum with the buckets is revolved by means of a simple round-about gear worked by a pair of bullocks. The lever to which the bullocks are yoked gives motion to a horizontal toothed disc,⁶ which turns a rude cog-wheel⁷ which again turns the drum. The buckets are generally earthenware vessels holding about 3 pints of water⁸. The use of this water-lift appears to have been introduced from abroad, certainly it has spread slowly through the Province from the north-west, and till recently was almost unknown in the south-east.⁹ The substitution of iron for the wood in the machinery

¹ *S.M.* 433.

² *Thal*

³ *rahat*.

⁴ *bair*.

⁵ *nahal*.

⁶ *chakal*.

⁷ *chali*.

⁸ *Roberts* 65,

⁹ *Baden Powell* 94 note.

and of aluminium for the earthenware in the buckets is a modern invention which has added greatly to the efficiency of the Persian wheel; while the introduction of a cheap form of metal roller bearing reduces friction considerably and permits simple automatic lubrication of the moving parts.¹

The indigenous water-lift of India was the less efficient rope and leather bucket,² which is still in common use in the south-east. “It consists of a whole bullock hide, with the corners cut off, and tied by leather thongs to an iron ring nearly 2 feet in diameter. It holds about 30 gallons of water.” The bag is pulled up by a pair of oxen by means of a rope passing over a pulley at the top of the well, and attached to the bucket and to the yoke of the oxen. The cattle walk down an inclined plane, and this tends to even the work, as the cattle have to climb up without a load. On the bag reaching the level of the discharging trough, it is emptied by an attendant stationed there for the purpose. The emptying of the bag is facilitated by the driver jerking the rope on receiving a signal from the man at the well. The toggle³ attaching the rope to the yoke is detached and the bag thrown into the well, where it descends by its own weight. The bullocks turn round and walk up the incline for the next load. Sometimes two pairs are used and in that case three men are employed instead of two.⁴ But this method is more costly than the Persian wheel both in man and bullock-power. “Every man is his own master on a Persian wheel. He need wait for no one, and can work by day or by night, in summer or in winter. There is no hollow⁵ to get filled with water after every shower of rain, and no rope to break and injure or kill some one.”⁶

The problem of spreading irrigation over irrigated areas where canal irrigation is impossible is a most important one. Its successful solution would bring agriculturally backward districts such as Gurgaon or

¹ A.C.M. 181-2.

² *charsa*.

³ *kili*.

⁴ Roberts 66-7.

⁵ *gohn*.

⁶ Brayne 4.

Rawalpindi up to the level of fertility of the Canal Colonies. It is for this reason that "agricultural engineers have devoted themselves to the improvement of wells and to the introduction of small oil engines for lifting water. The supply has been increased in a large number of cases by connecting ordinary wells, with the great subterranean supplies" of water by means of a simple tube or by a circular passage through the bedrock. The water supply of the well then becomes practically inexhaustible and the installation of a suitable engine and pump becomes a practical proposition. "Recently this improvement has been carried a stage further. A form of irrigation intermediate between the perennial canal and a good well has been developed. This is the strainer tube-well, a device by which the water in the deep-seated layers of coarse sand can be raised to the surface by a pump driven by an old engine. These installations are often 260 feet in depth and are capable of watering 200 to 400 acres."¹ The most common tube strainer consists essentially of a copper mesh supported on a strong iron frame. This is inserted in the soil so as to reach several feet into the subsoil water-bearing stratum, and so enables a much larger volume of water to be tapped than is possible in the case of an ordinary well; earthenware strainers evolved by Mr. Miller-Brownlie, the Punjab Agricultural Engineer, are now also beginning to be used.²

But a serious handicap to the spread of tube-wells is due to the zeal of the State, which is not always according to knowledge. To the ordinary village ironmonger³ any kind of steam engine is far easier and simpler to handle than any oil engine. It is therefore a great pity that efforts have not been made to produce for agricultural purposes a simple, cheap portable engine of comparatively small-horse power which could also be easily converted to burn oil fuel if necessary. Steam engines for purely agricultural purposes are at a disadvantage in India as compared with oil engines on account of the pedantic Boiler Inspection

¹ *Indian Agriculture* 50-1.

² *P.A.R.* (1923-24) 197 note 2.

³ *Lohar.*

Act, which applies to every steam engine however small the provisions which are necessary to prevent loss of life from the explosions of the enormous engines used in factories. In Egypt steam engines are not inspected and in spite of the heavy cost of fuel there they are very widely used on canals for pumping. There is no doubt that the annual inspection of agriculturists' steam boilers is a distinct hardship, and if it has not been found necessary in other countries it is difficult to see why it should be insisted on in India.¹ (When cheap current becomes available in the Eastern Punjab there is certain to be a great development of tube-well irrigation and it is not unlikely that the raising of water by cattle power from innumerable small surface wells will then give place to a few strainer tube-wells, each commanding several hundred acres and operated by suitable motors.² But it is obvious that if a large tube-well reduces the level of the sub-soil in its neighbourhood by giving a larger discharge than the subsoil can supply, the amount of irrigation water made available will rapidly decrease. This is what has happened in the Amritsar scheme, where batteries of tube-wells are driven from a central power station. It also occurred in a similar scheme in the Fayum in Egypt.³ Tube-wells and canals are directly opposite in their effects on the water-table and it will be one of the chief duties of the future Ministers of Agriculture in the Punjab to see that these effects balance one another.

The depth from which well water has to be drawn, the Economics of character of the water-bearing stratum, the the well. sweetness or brackishness of the water, the cost of constructing wells and providing and renewing well gear, the extent to which irrigation is assisted by rainfall or river floods, the sufficiency of the supply of well bullocks, the periods during which wells can be worked without intermission, their irrigating capacity as shown by the average area of crops which they water, are all matters

¹ A.J.I. (July 1925) 275-6.

² Indian Agriculture 51.

³ A.J.I. (July 1925) 276.



affecting the economic return from them. The price and the keep of the bullocks are heavy items of expenditure. The water-table sometimes sinks with curious rapidity and after 35 feet have been passed, every fall of a few feet involves either a large diminution in the irrigating capacity of the wells, or a marked increase in the cost of working them. Well irrigation and small holdings generally go together, and the surplus remaining with the husbandman after paying the revenue and providing for the support of his family is always small. The life of a peasant with a small well irrigated holding is often a hard one. In the drier parts of the province the wells by themselves cannot mature any large area without the help of river floods in autumn or of waterings from inundation canals, both precarious sources of moisture. On such wells moreover a considerable part of the area has to be given up to provide green wheat and turnips as fodder for the cattle, and in dry years this area inevitably expands. Even in more favoured tracts, during seasons of severe drought, valuable crops, such as sugarcane, are often sacrificed to keep the bullocks fit for work; and even then many of the cattle succumb to the incessant work. And an outbreak of murrain may do quickly in an ordinary year what drought effects more slowly.¹

The difficulty of obtaining the precious water is seen in the cultivators' care in the use of it. Not a drop is wasted and it is only used for high grade crops. Still further economy could be effected by the use of pipes; while the proper fencing of well lands would save valuable crops from the depredations of wild animals or tame neighbours cattle.² Yet even now the yield on well-irrigated lands is at least one-third more than that on canal-watered lands. A well with water 35 feet from the surface costs now-a-days about Rs. 1,000. Unlined wells cost only about Re. 1 per foot, but seldom last more than three years. Assuming this average cost the total capital invested in wells amounts to about Rs. 29 crores. As a rule well-irrigation is not practised

¹ S.M. 387, 435, L.A.M. 557.

² *Brayne* 9, 55.



where the depth of water is much over 35 feet, as beyond that depth the cost of lifting becomes excessive in comparison with the value of the crops. In tracts like Gurgaon, however, the wells are generally 50 to 60 feet deep and are extensively used for winter waterings for barley. That tract, however, has a fairly secure rainfall, and wells merely supplement the rain, and crops generally get two well-irrigations as compared to four or five in districts like Jullundur and Sialkot. Under such circumstances it pays to lift the water from a much greater depth than is usually considered profitable.¹ The ordinary well gives a discharge of about 1/12 cusec.² With a tube well supplies up to 3 or more cusecs can be obtained by having a sufficiently wide pipe put into the requisite depth of water-bearing strata.³ The water extracted from one tube-well may irrigate up to 350 acres as compared with the 10 to 15 acres irrigated by an ordinary well.

Well-boring has been very successful in several parts of the south east Punjab, where the depth of the water-table renders an artesian supply particularly desirable. The value of such well-boring to the peasantry of these tracts cannot be over estimated. But the initial cost of a tube-well installation is high, and a financial question has arisen. The peasants are, in any case, expected to pay for the actual out-of-pocket expenses on each well bored. But an additional overhead charge of Rs. 50 or Rs. 100 would enable the whole well-boring establishment to be self-supporting and capable of indefinite expansion without the need for any Government grant. The execution of such work at concession rates in accordance with a promise extorted from a vote-catching Reforms Minister, carries with it the danger that

¹ P.A.R. 299.

² A cusec=a cubic foot per second or 20,000 gallons per hour. A cusec will give water to the depth of one inch over one acre in one hour. A canal outlet designed to give one cusec is generally allowed for 300 acres of land. The area of crop which is produced by one cusec is greatly increased when wheat and similar cold weather crops are grown, as two or three waterings are sufficient to bring wheat to maturity. The discharge of the Thames at Teddington is about 1,500 cusecs.

³ Roberts 69.

the extension of this valuable work may be limited by lack of funds.¹ A more reasonable course would be to introduce a demonstration installation, as the economics of the tube-well is still a subject for investigation. A balance sheet, in which the capital cost and working expenses of the installation were contrasted with the increased value of the crops and of the land, would be an interesting document. If the water is used with judgment, an increase in fertility should result, and the tube-well would then furnish a powerful argument for the investment of money in the development of the soil of India.² Both in the matter of oil engines and tube-wells it is unreasonable to expect poor Punjab peasants to risk their capital until Government has demonstrated that it is a safe and profitable investment.³

II.—CANALS.

And the parched ground shall become a pool,
 and the thirsty land springs of water.

Isaiah xxxv 7.

The Punjab
 Canals.

“In the Hindu trinity Brahma creates and Vishnu preserves, but their work is spoilt by the third member of the godhead, Siva, who destroys. This Siva, until the English came and made war upon him, was supreme, more feared and worshipped than his titular co-equals were loved and adored. After a prolonged struggle they at least succeeded—*pace* Plague—in deposing, killing and burying him,” and their victory has been chiefly due to the persistent skill with which they gradually converted the great rivers of the Punjab into food-producers.

“After collecting their strength in the Himalayas, and boring passages through the last of the mountain barriers between them and the open country, these rivers sweep and tear through a submontane zone under the partial confinement of water-worn and fairly consistent banks. Southwards,

¹ P.A.R. (1923-24) 197.

² *Indian Agriculture* 51.

³ *Brayne* 54.

at distances ranging from forty to eighty miles from the hills, the aspect of the country changes, rock, loam gravel and herbage disappearing, and merging into a vast expanse of flat sandy plain, which in turn deepens into the deserts of Sind, Bahawalpur, and Rajputana. Through that northern plain the rivers move south-west towards the Indus, a large part of their flow being underground."

For thousands of years succeeding rulers had allowed those noble rivers "to traverse the great plain of the Punjab unutilized, although all were potentially as powerful life-rivers as the Nile—in the hot months veritable floods of liquid gold, in the cold patchy and easily tractable streams, creeping sluggishly southwards but a foot or two below the levels of the broad depressions which limited their wanderings east and west." The inhabitants had aptly called their country, "The Land of the Five Rivers,"¹ and Ranjit Singh by pushing his conquests westwards to the foot of the Sulaiman Range had added a sixth, the Indus. But, "rulers and people, instead of collaborating and drawing assured sufficiency from the rivers, had in their ignorance and ineptitude trusted to the luck of each season's rainfall for their food-supplies, scratching the seed into the thirsty soil, and leaving results to the caprices of the niggard heavens."²

"To-day, as the result of the continuous and combined labours of British engineers and revenue-officers, one after another of the great rivers of the Province has been harnessed to the service of agriculture, great dams have been thrown across them, and the fertilising waters which used to flow uselessly into the Indian Ocean or the Bay of Bengal are now spread in an increasing flow over the arid uplands, transforming them into expanses of rich cultivation supporting millions of industrious peasants. The Punjab irrigation system, built up in the last seventy years, is already twice as great as that of Egypt, which is the product of at least six thousand years, and if and when the present great projects are carried out, the irrigated area will be 20 million acres.

¹ Punjab, from Persian *Punj*, five, *Ab* water.

² Thorburn. P.P.W. 262-3.

The great irrigation schemes carried out by British enterprise and British capital have raised the Punjab from the poorest to the richest province, agriculturally, in India, and have permanently banished the gaunt spectre of famine.¹ Thanks to the skill of the Punjab Irrigation Engineers and the energy of successive Colonization Officers the Lower Chenab Colony has become one of the richest tracts in the Punjab. The Lyallpur district where a few years ago the desert held its sway, has now nearly a million prosperous inhabitants and its produce in cotton, wheat and oilseeds is bartered for in the markets of the world.²

On the arrival of the British in the Punjab the country shewed little economic advance on the state in which Alexander found it some two thousand years earlier. He found there no great irrigation system such as impressed his imagination by the waters of Babylon. He saw no sacred bull, as in Egypt.

“Trampling the unshowered grass with lowings loud.”

The Moghuls did indeed start the Western Jumna Canal, but it was for their own enjoyment rather than the public benefit. Moreover, even if the early rulers could have designed such great works as we are now familiar with, there would have remained the difficulties due to lack of capital and labour, and in the absence of railways and roads, the surplus produce could not have been transported to market. It was not until the early nineteenth century that railways and macadamised roads made their appearance in Great Britain and there was no time for the new idea to reach India before the death of Ranjit Singh.³

The first efforts of the British engineers were directed to the improvement of existing indigenous works rather than the construction of new irrigation projects. Of these, in the Punjab, the most important was the Western Jumna Canal. Its origin is shrouded in antiquity.

¹ O'Dwyer 251.

² P.A.R. (1922-3) 115.

³ P.A.R. 301.

The first record of an irrigation project in the Jumna Valley is that of a canal, built by Feroz Shah¹ about the middle of the fourteenth century with its terminus at Hissar, but whether it derived its supply from the Jumna or from the Chautung Nala, a stream further to the west and now merely a dry depression, is uncertain. As the main object of the work was to convey water to the Emperor's hunting lodge at Hissar rather than to irrigate the intermediate country, advantage was taken in fixing the alignment of any natural hollow, or channel whose slope and direction were found suitable. Consequently the resulting work took the form of a linked series of drainages rather than of a canal, as the word is understood to-day.²

About 1568, the channel, which had fallen into disuse, was renovated by Akbar, the Moghul Emperor, the object being, in this case, the irrigation of the Hissar district, which Akbar was bestowing upon his son, afterwards the Emperor Jehangir. "God has said from water all things are made. I consequently ordain that this jungle, in which subsistence is obtained with thirst, be converted into a place of comfort." Thus ran the Imperial rescript,³ in which the renovation was ordered, and once again, after an interval of a century, water was conveyed by the canal to Hissar. Sixty years later further remodelling became necessary and in 1628 this was carried out under the direction of Ali Mardan Khan, Shah Jehan's⁴ great engineer, a new branch being opened to convey water to the fountains of the Imperial palace and to adorn the streets of the rising city which the Emperor was erecting at Delhi. The maintenance of the supply, however, required constant labour and a greater degree of attention than was likely to be accorded to it amongst the pressing cares of a falling empire. Consequently, by the middle of the eighteenth century the canal had ceased to flow and it remained in disuse until reopened by the British.⁵

¹ Feroz Shah Tughlaq, Muhammadan King of Delhi. See *L.F.R.* 120.

² *P.A.R.* 302.

³ *Sanad.*

⁴ The Moghul Emperor who succeeded Jehangir.

⁵ *P.A.R.* 303.



In 1821 a small instalment of the waters of the Jumna was again diverted into the Delhi canal. But the experiment was mistrusted both by Government and by the population of the tract affected; funds were severely restricted and the original alignment was consequently adhered to natural channels continuing to be utilized as far as possible and depressions being crossed on earthen banks with no adequate provision for the intercepted drainage. As was to be expected, swamps formed upstream of the canal. Occasionally the banks gave way, causing widespread injury to the villages and crops in the vicinity. The famine of 1832-33 led to the enlargement and multiplication of the irrigating channels, but these were executed in haste upon imperfect information and on bad alignments. Altogether the early history of the Western Jumna Canal is one of dearly bought lessons in hydraulic engineering. No check was put on over-irrigation; and this fact, together with the faulty design of the canal itself, led to large portions of the commanded tract becoming waterlogged. Saline efflorescence made its appearance, and there were yearly epidemics of malaria.¹

In 1873 the remodelling of the canal as a whole was taken in hand, the old alignment was improved, and, in its lower reaches at least, the Western Jumna Canal is now entitled to rank as a modern irrigation work. At Tajawala, where the Jumna debouches from the hills, it was dammed by a permanent weir, which diverted the stream through a regulator into the western branch of the river, which itself serves the purposes of a canal for the first thirteen miles. At this point it is joined by the Somb and Pathrala torrents and a dam at Dadpur across the combined stream directs it into the excavated channel. The main canal and the Delhi Branch have been realigned for a great part of their course, and drainage works have been freely introduced. The Sirsa Branch, the largest Branch of the Canal, was added in 1889-95 and the whole system, from being a standing reproach, is now an unmixed blessing to the countryside. Over 2,000

¹ P.A.R. 304.

miles of main canals and distributaries are in operation and in 1919-20, 855,000 acres were irrigated, returning 11½ per cent. on the capital outlay of Rs. 178 lakhs.¹

To Ali Mardan Khan was also due the inception of the Upper Bari Doab Canal, which irrigates the country round Lahore and Amritsar. It was he who constructed a small canal from the Ravi river to bring water to Lahore. Thence more than a century later Ranjit Singh and his Sikhs extended it to Amritsar, there to fill the sacred tank about the Golden Temple. After annexation, one of the earliest self-imposed duties of the kind-hearted Henry Lawrence² was the conversion of this into a great irrigation canal. Could he but intercept the Ravi under the hills, and spread its waters over the Manjha³ the profits from plough and hoe would reconcile the disbanded Sikhs to the loss of sword and musket. "His project materialised into the Upper Bari Doab Canal, the headworks of which were at Madhopur near Pathankot. Excavation was begun in 1851, but for some years progress was slow and results unsatisfactory. At that time river hydraulics were a novel science in India, the Ganges Canal, the prototype of all its successors, was still under construction, and on it, as well as on the Bari Doab, engineers had to learn by making mistakes. On the Ravi difficulties were increased and expenses enhanced by the heavy nature of the cuttings, and the necessity for a series of falls to regulate a drop of 326 feet in the first twenty miles of the main canal. Time and energy were also wasted in a futile attempt to make the canal navigable by means of locks. "However, by 1861, irrigation began and by 1889 the interest account was cleared, a remarkable achievement for the pioneer canal of the Punjab," whose ultimate success as a commercial venture had been assured early in the sixties. In 1916 it irrigated no less than 1·2 million acres, paying a return of no less than 12 per cent. on the Rs. 1½ crores invested on its construction.⁴

¹ P.A.R. 305.

² Member of the Board of Administration. See p. 11.

³ The central Sikh tract of the Punjab round Lahore and Amritsar.

⁴ Roberts 9, Thorburn P.P.W. 265.



The canals which rely upon the natural flow of the rivers for their supplies may be divided into two main types, perennial canals and inundation canals. At the head of a perennial canal is a weir or barrage across the bed of the parent stream, or some other construction which will bank up water to the height required in the canal, thus counteracting seasonal fluctuations in the water level in the river. Such a weir is fitted with shutters and sluices whereby surplus water, not needed in the canal, can escape down the river. Inundation canals on the contrary have no such weirs and their supplies fluctuate with the natural water level in the river. When this rises, the level in the canal rises, when it falls, the level in the canal falls with it. Generally speaking, inundation canals obtain a supply only when the parent stream is in flood; and the adequacy or otherwise of this supply, and consequently the area irrigable in the year in question, is, therefore, dependent solely upon the seasonal conditions. There may be an ample volume in the river but, in the absence of any method of raising its level, it cannot be forced into the canal until the water rises of its own accord, to a sufficient height.¹

Such canals as existed before the British annexation of the Punjab were mostly of the inundation type. In some parts of the Province they were in a serviceable condition, in others they had been allowed to become choked and useless. Strenuous efforts were immediately made to restore them and to extend their scope. Old channels were cleared, remodelled and extended; new canals were constructed and several which had been built by private agency were taken over by Government at their owners' request.² Some lessees of Government waste land were also encouraged to dig private canals to irrigate their grants, and a good deal was done to extend cultivation in this way, especially in the Shahpur district. The canal owners used the water largely to irrigate their own lands, but gave any they could spare to their neighbours, charging a water rate usually in the form of a share of the produce.³ About 1880 the cultivators of the

¹ P.A.R. 387.² P.A.R. 309.³ L.A.M. 786.

Ferozepur district who lived near the Sutlej, were induced by their energetic Deputy Commissioner, Major Grey, to construct a number of small private canals to water their own land.

It was inevitable that difficult questions should arise in connection with private canals and it was evident that the elaborate provisions of the Northern India Canal and Drainage Act,¹ which was drawn up by lawyers for large canals, could not be adapted to these special conditions. The owner of a private canal is not, like a man who irrigates his own land from his own well, independent of relations with all persons outside the ring-fence of his own property. Even when the canal is constructed solely to irrigate the owner's land, the interests of the State are involved in the withdrawal of water from the river or natural stream; and it is rarely the case that the supply channel can be constructed without its bed passing through land belonging to other persons. More commonly irrigation is supplied to any land, however owned, which may be commanded by the available supply. In such a case peace and good government demand some control over the activities of both canal owners and other irrigators. Moreover, a private individual having secured a monopoly of the water supply, might charge others so high a price for it as to interfere with the legitimate claims of Government to land revenue. These considerations led to the passing of the Punjab Minor Canals Act,² which legislated for all smaller irrigation works whether private or not.³

Unlike most inundation canals, the Lower Sohag and Para Canal was constructed not from private, but Imperial funds. The canal derives its name from the great Sohag water channel⁴ and its offshoot the Para, the course of which it approximately follows. The head of the water-channel is on the right bank of the Sutlej some 45 miles below Ferozepur. For many years prior to the construction of the canal a small cut, some twenty feet in width, had been made from

¹ Act III of 1873.

² Act III of 1905.

³ L.A.M. 786-7.

⁴ nullah.

the Sutlej down the bed of the water channel, forming as it were a central gullet, through which water was carried to a point about twenty miles from the head, where it was impounded and used for the irrigation of the surrounding lands. This formed the basis of the Lower Sohag Canal which was excavated in the bed of the water channel¹ for the first nineteen miles of its course; though occasionally cuttings were made across the necks of the large bends and loops, which were a peculiar feature of the old drainage line. After the nineteenth mile a new artificial channel was dug which continued up to the thirty-third mile, where it split into two branches, one following approximately the alignment of the Sohag nullah, and the other that of its effluent, the Para.²

The Sidhnai canal which was constructed at the same time, its main canal being opened in 1886, was only partly inundation. It derives its name from that of the remarkable reach of the Ravi on which its head is situated. For most of its length the river is singularly tortuous and the banks are comparatively low, but in the Sidhnai reach, which terminates where the river debouches into the open a few miles above its junction with the Chenab, the centre line is almost straight for over eleven miles and the banks are firm, high and well defined, the width between them increasing almost uniformly from about 450 feet at the narrowest point, near the upper end, to 1,400 feet at the tail. The weir is situated about half way down this reach. It is 738 feet long between abutments, and is divided by piers into 32 bays each of 20 feet. The tops of these piers are connected by timber beams and the vents thus formed are closed by means of narrow wooden planks placed vertically with their upper ends resting against the crest of the weir. When the river is low the vents are kept closed, the planks being gradually removed as the water rises, to allow of the free passage of floods. The Sidhnai Canal proper is 37 miles long, while the three smaller canals have a combined length

¹ nullah.

² P.A.R. 329.



of 31 miles, the maximum discharge of the whole system being about 1,800 cusecs. From these main lines 384 miles of distributaries are fed.¹

The Sidhnai canal is in one respect unique; for while its permanent headworks exclude it from the category of inundation canals, its practical limitations prevent its being perennial. The supply in the river during the cold weather is insufficient for the needs of the Upper Bari Doab Canal which draws off every available drop of water at Madhopur more than 300 miles higher up, and any small volume, which percolates through or below the works there, is lost again in the river bed long before the Sidhnai headworks are reached. It, therefore, frequently happens that the Sidhnai reach is dry for several consecutive weeks, or even months, during the winter. The canal thus holds a position midway between that of a perennial and that of an inundation canal. It resembles the former in that, when there is any water in the river, its headworks enable it to utilize the whole volume irrespective of the natural surface level, it resembles the latter in that it has generally, owing to shortage of supply, to remain closed during a part of the cold weather season. But the position of its headworks enables it to obtain water both earlier and later than would be possible were it merely an inundation canal.² The area commanded by the system is 417,000 acres of which 232,000 acres were originally Government waste.

Colonization began in 1896 in which year the canal was opened. For some time success seemed doubtful. A few prospectors came down and returned dissatisfied. The jungle waste looked uninviting and the indigenous inhabitants showed themselves decidedly hostile to the strangers. But with the arrival of a party of pioneer colonists from Amritsar the tide turned, and once a beginning had been made, no further difficulty was encountered. The main work of colonization was completed within $2\frac{1}{2}$ years, and another flourishing colony added to the Punjab.³

¹ P.A.R. 335.

² P.A.R. 336.

³ P.A.R. 337.

The success of the scheme can be gauged by the direct financial returns to Government which, of course, represent only a small fraction of the colonists' profits. The capital account of the system stands at Rs. 13½ lakhs and, after paying all its working expenses and interest charges, it had, in 1921, returned six times the amount in the shape of net profits in the 35 years during which it has been in operation. In 1919-20 284,000 acres were irrigated from it, and it yielded a return of over 40 per cent. on the capital originally invested in it. It was largely owing to the success obtained on the Sidhnai canal that Government was encouraged to proceed with further experiments in colonization and on a far greater scale.¹

A still further stimulus was given to irrigation when the Secretary of State accepted the principle of financing productive works from loans raised in the open market. The works already constructed had furnished a series of valuable lessons. It had been clearly demonstrated that irrigation canals, if properly designed and situated, were extremely lucrative investments. And now for the first time a regular and adequate supply of capital was forthcoming. The direct result of the new policy was the inauguration of five works of great magnitude.

Of these the Sirhind Canal was one.² "The design was daring. Its feasibility was doubtful. A heavy expenditure was certain. It was no light matter to divert a large part of the Sutlej at its debouchure from the Siwaliks below Simla, convey its intercepted waters by a high-level main canal for thirty-nine miles through a very difficult country to Doraha,³ and thence spread them over the Jat country lying between Ludhiana, the Bikanir desert, and the Ghaggar stream. Of the commanded area, a tract larger than Wales, two-thirds was in British territory, and the rest divided between the native states of Patiala, Jind and Nabha." The crux of the enterprise lay in the few first miles between the headworks and Doraha. The construction of the 2,500 miles of branches

¹ P.A.R. 336.

² P.A.R. 337.

³ The point where the Sirhind Canal cuts the main railway line from Lahore to Ambala.

and distributaries, which diverged from that point, was a comparatively simple matter. But the problems to be faced higher up were difficult indeed. In 11 out of the 39 miles of the main canal the spring level was many feet above the canal bed. Throughout its whole length the main canal had to be carried across two gigantic torrent beds draining a mountainous catchment area as large as Yorkshire, with twice its rainfall. The head weir needed delicate engineering to draw off for the canal 6,000 cusecs out of the 300,000 which in floods rush down the bed of the Sutlej. The scheme was finally approved in 1879. To carry it out 1,800 convicts and multitudes of free labourers (including during three famine years 15,000 relief workers from Sirsa and Bikanir), were located in movable camps at different points along the line. To get materials the constructing engineers had to ransack the Himalayan forests and the quarries, brick-fields, and (*horresco referens*¹) buried cities of the Punjab, particularly Sirhind. A temporary railway was laid down to supply provisions and materials.

The cross drainages were disposed of by taking them under or over the canal by means of masonry conduits. Of the former a good example is the Dohar torrent siphon, which passes 5,000 cusecs, of the latter the passages for the Siswan and combined Sugh-Budki torrent. "The Siswan has a discharge during floods of 30,000 cusecs, the Sugh-Budki of 40,000, which latter is more than six times the designed volume in the main canal, and considerably more than the minimum of the Nile. The aqueducts which transported over and under the main canal the tens of thousands of tons of water, sand, mud and gravel, suddenly hurled upon it after every heavy downpour in the hills, are necessarily of a size and solidity compared with which the largest bridges in Europe are inconsiderable." That since 1882, when Lord Ripon formally opened the canal, these massive aqueducts have withstood the attacks of

¹ This was the age of Political Economy that built the Albert Memorial and nearly destroyed the beautiful Southampton Bargate. Lord Curzon was the first to realise the importance of preserving the archeological treasures of India.

repeated floods, is a sufficient testimony to the high quality of their design and execution. "The successful carrying of the main canal over three miles of low lying marsh land was rather a triumph for dogged persistence than engineering skill. As the bed of the canal had to be excavated to a depth of 14 feet below spring level and raised as many above it, the chief difficulty lay in counteracting the constant inflow of water into the excavations. This was effected by incessant pumping and the casemating of the sides and bed as work progressed. In addition, as the marsh had no bottom other than soft mud, a precarious stability for the masonry superstructures required at various points had to be obtained by sinking wells to considerable depths and surrounding them with stones and blocks of concrete."¹

Under an agreement drawn up in 1873 with the British Government, one-third of the cost of the canal was paid by the three signatory States of Patiala, Jind and Nabha who in return are entitled to one-third of the supply of water available. In addition to this, each State undertakes the maintenance and management of its own distributaries, exercises a complete control over the irrigation effected by them, and assesses and collects its own revenue. On the British branches this system does not obtain, and irrigation is carried on and rates are collected without reference to territorial considerations.² The total area irrigated by the Sirhind Canal amounts to 600,000 acres, of which 4,050,000 acres are on the British and 550,000 acres on the Indian States Branches. Its total capital cost up to 1921 amounted to nearly Rs. 4 crores, the British share being over Rs. 2½ crores, on which a return of 11½ per cent. was realized.³

The Lower Chenab Canal can claim, with considerable justification, to be the most extensive and successful irrigation system in India, and probably in the world. In view of this fact, it is difficult now to realize how inauspicious was its commencement, how at one time it seemed doomed to ignominious failure and what vicissitudes it passed through before it attained its present

¹ Thorburn, P.P.W. 266—8.

² P.A.R. 314. ³ P.A.R. 319.

status. The watershed between the Chenab and Ravi rivers was an ideal situation for an irrigation canal. The Chenab afforded a splendid and unfailing source of supply, requiring neither deep digging nor any difficult engineering and offering a vast field for irrigation at a minimum cost. The watershed was large, the soil for the most part very fertile and the bulk of the land Government waste. The rainfall, moreover, was extremely deficient, so much so that in the upper portion of the tract, cultivation of any sort was very precarious without irrigation, while more than half the area was desert. Seldom, if ever, has a combination of circumstances, so favourable to the introduction of canal irrigation, been met with in any project. The first proposals for the irrigation of these tracts were framed in 1875 and contemplated an enormous canal, with its head above Merala, where the head works of the recently constructed Upper Chenab Canal are now situated, and a distribution system embracing the whole of the Chenab Ravi watershed. Though it possessed many defects in detail, the project was a remarkably complete one, but it proved to be in advance of its time. With no experience of colonization, the financial prospects of the scheme appeared to Government to be, to say the least of it, uncertain, and, under the circumstances, they not unnaturally hesitated to embark upon the large expenditure entailed, estimated at nearly Rs. $3\frac{1}{2}$ crores.¹

The caution which dictated the rejection of the original project was manifested to excess in the proposal (framed in 1882), for a small inundation canal, the so-called Ramnagar Canal, with its head some 40 miles below Merala, designed to irrigate 144,000 acres at a cost of about Rs. $\frac{1}{3}$ crore. This project was sanctioned in 1884 and the canal was opened in 1887. It was a complete failure from the first. The estimate of cost was greatly exceeded and the prospects of its ever proving remunerative were extremely remote. The canal silted heavily in the flood season, and when the floods subsided there was no means of forcing water into it to mature the

¹ P.A.R. 340.

crops sown. In view of the uncertainty of the supply, colonization was an obvious impossibility.¹

In 1889, therefore, a fresh project was prepared, which provided for a weir across the river and a considerable extension of the canal system, the estimate amounting to Rs. 104 lakhs and the anticipated area of irrigation to 400,000 acres. The site chosen for the head-works was some eight miles above the offtake of the Ramnagar Canal, this point being selected so as to enable the latter to be fed without any great modification of levels. The project was sanctioned in 1890 and construction was immediately commenced, a special circle of superintendence being formed for the purpose with Major S. L. Jacob in Charge.²

The Lower Chenab Canal, as it exists at present, is mainly due to the initiative of this officer. No sooner had he assumed charge of the works than he perceived the desirability of a further extension of the scope of the sanctioned scheme, and commenced to press upon the notice of Government the advisability of the preparation of a complete survey of the watershed, with a view to the formation of yet a third project, to embrace the whole area which could be commanded. His views were accepted and the necessary surveys put in hand simultaneously with the construction of the weir. The difficulties attendant on these surveys, carried out as they were in an uninhabited desert, were enormous, but eventually the whole watershed was cross-sectioned at 2,000 feet intervals and the maps so prepared have since been proved to be very fairly accurate. On the basis of them a revised project was drawn up in 1891. Major Jacob estimated for a canal with a head capacity of 9,000 cusecs and included in the area to be irrigated all the land in the watershed where the subsoil water level was more than 40 feet from the surface. The cost of these proposals was estimated at over Rs. 2 $\frac{3}{4}$ crores and the annual area of irrigation at 1,170,000 acres. This estimate was, however, modified by the higher authorities, the discharge being reduced to 8,000 cusecs, the cost

¹ P.A.R. 341.

² P.A.R. 342.

to Rs. 2 $\frac{2}{3}$ crores and the annual area to 1,100,000 acres, an area less than half of that which was subsequently actually irrigated.

The tract which the canal was designed to serve was one of extreme desolation. Water lay for the most part from eighty to a hundred and twenty feet below the surface of the soil, while the rainfall was scanty and uncertain. With the exception of snakes and lizards the country was extraordinarily devoid of animal life. The vegetation, such as it was, consisted mainly of dusty shrubs, some of a certain value as fuel, but others of no use either to man or beast. Grazing was, generally speaking, conspicuous by its absence. The only inhabitants of the country were the indigenous nomads, a spare and hardy race who eked out a precarious existence by means of their camels and goats, whose milk formed almost their sole article of diet. Such was the country in which the engineers were destined to live and labour for many years, and which the Lower Chenab Canal has converted from a wilderness into a garden.¹

The head of the canal is situated at Khanki where the river is spanned by a weir of 4,090 feet long, divided into eight bays each of 500 feet, with a flying bridge consisting of a cradle running on a wire rope from bay to bay, to permit of men crossing the weir during floods. As constructed, the weir was little more than a bar across the river to prevent retrogression of levels, the raising of the water surface being effected by means of falling shutters, six feet high, erected on its crest. Undersluices, consisting of 12 vents each 20 feet wide, were provided on the left flank of the weir immediately below the head regulator, which was given 12 openings of 24 $\frac{1}{2}$ feet width, each opening being divided by small piers into three vents 6 $\frac{1}{2}$ feet wide.²

Considerable modifications have been made in the head works since their original construction. In 1910, in view of the enormous quantities of silt which were found to enter the canal, a raised sill was added to the head regulator and in

¹ P.A.R. 344.

² P.A.R. 345.

order to obtain the same area of waterway, the small dividing piers were removed and a subsidiary regulator of five spans of $24\frac{1}{2}$ feet width constructed a short distance above it. In 1918-19 the weir crest was raised by $2\frac{1}{3}$ feet to enable better control of supplies to be obtained, and the gates and gearing of the undersluices were replaced by modern gates of the Stoney pattern.¹

The canal carries the enormous discharge of 10,700 cusecs, six times that of the Thames at Teddington, which it distributes by means of a system comprising 427 miles of main canal and branches and 2,243 miles of distributaries. There are nine branches, ranging from the great Gugera Branch, with a discharge of 4,500 cusecs, itself a large canal, to the little Kot Nikka with a discharge of only 360 cusecs.²

The construction of the canal was complicated by the fact that the smaller canal and the new headworks had been opened in 1892 so that the enlargement of the main line for a width of 109 to one of 250 feet including the rebuilding of the bridges and the regrading of the bed, had to be carried out while the canal was in flow and irrigation in course of development. The enlargement was effected by constructing a second canal alongside the first, leaving only an earthen embankment between, and subsequently both were run together. The removal of this embankment was no easy matter, as the tract to be irrigated was almost waterless and the people were dependent on the canal not only for their crops but also for water for drinking purposes and all domestic needs.

Closures were therefore rarely possible and then only for very short periods. The excavation of the parallel channel was practically completed by the end of the cold weather of 1896-97 and between then and 1899 attempts were made to remove the dividing bank by means of powerful dredgers with the canal flowing. But this method proved unsuccessful. As the section of the bank was reduced, it breached irregularly, causing large silt deposits in some places and deep

¹ P.A.R. 346.

² P.A.R. 347.

scour in others. Meanwhile, owing to the rapid development of irrigation, increased supplies of water were required from the canal. This necessitated the removal of the obstruction. Eventually it was decided to remove the bank, which contained over 30 million cubic feet of earth by spade and basket labour. The canal was closed for twenty days in 1899 and again for ten days in the succeeding April. Special arrangements were made for labour, and men were crowded on the bank as close as they could work. Large gangs were raised locally from the adjacent canal colonies which rendered cheerful and material assistance. The action taken was completely successful and at the end of the second closure the main line was clear.¹

Colonization began in 1892, and in the earlier years the The Lower colonists had an even harder time than usual. Chenab Canal Colony. There was no railway to the colony and they had consequently to march thither through a country nearly as waste as that to which they were going, inhabited by tribes which showed little mercy to immigrants whom they could waylay. Many, therefore, never reached the colony at all. Those who did, found the tract peopled by nomads, who neither desired nor expected the canal to be a success, and were determined to do all in their power to prevent its being so. The rainfall in the previous years had been very scanty and the country presented a particularly desolate appearance, so much so, that many of the colonists refused to believe that the land was worth cultivating and returned to their homes. A serious epidemic of cholera broke out; and though those who survived, and had the pluck to persevere, were rewarded by an excellent crop, their troubles were not yet at an end, as the labour available was insufficient to harvest it all, and even when harvested, there was still the difficulty of marketing the produce by the same perilous way by which the settlers came. The opposition offered by the nomads of the tract was also a constant source of trouble.² Rooted as he is to the soil, the agriculturist

¹ P.A.R. 348.

² P.A.R. 349.



is always peculiarly helpless in dealing with the elusive nomad, who raids him to-day, and disappears with his booty to-morrow.

This was, however, only a transitory phase. Once the fertility of the virgin soil of the watershed had been demonstrated by these pioneers, there was no lack of fresh settlers and the news spread quickly over the province of the magnificent crops which had, in a couple of harvest, converted the poorest colonists into men of substance. A land hunger arose which could not easily be appeased and it became possible to pick and choose the most desirable settler from among the thousands who applied. The nomads soon found the colonists more than their match. A railway for the carriage of produce was commenced in 1895. Roads came rapidly into being, and towns and factories began to spring up in a country which had only just ceased to be a desert. In ten years the population of the tract rose from 8,000 to 800,000. Lyallpur, the capital of the colony, is now an important city with an enormous export trade. In 1919-20 the value of the crops grown on the land irrigated by the Lower Chenab Canal was no less than Rs. 16 crores or nearly five times the capital cost of the work, practically the whole of these crops being raised upon land, which, thirty years before was barren waste where hardly a blade of grass would grow.¹

The example of the settlers was not lost on the nomads. Raids were rigorously repressed, and their dislike for a settled life was gradually overcome. Slowly they realised that the canal had come to stay; and they found it advisable to make for themselves the best terms they could. They were treated with great liberality in the matter of grants, and gradually settled down to a peaceful agricultural life, most of them now being fair, and many of them decidedly good, cultivators.²

In 1921 the capital account of the Lower Chenab Canal stood at Rs. 3½ crores on which it yielded an annual return of about 45 per cent. It is by far the most remunerative of the larger canals of India. It irrigates 2½ million acres and its

¹ P.A.R. 350.

² P.A.R. 351.

revenue account shewed in 1921 an accumulated profit, after paying all interest charges and working expenses, of the enormous sum of Rs. 16½ crores, a profit increasing annually by about Rs. 1½ crores.¹

Though it was one of the earliest canals to be commenced, the completion of the Lower Jhelum Canal was long delayed. This canal irrigates the western portion of the watershed lying between the Jhelum and the Chenab rivers, an almost rainless tract with a deep spring level, cultivation in which was practically impossible without artificial irrigation. Prior to the advent of the canal, the country was covered with a low scrub jungle, sometimes dense and elsewhere scattered and thin. Here and there were small patches of indifferent dry cultivation in local hollows where rainfall water was expected to collect; but the chief occupations of the scanty population which inhabited the tract were cattle-grazing and cattle-lifting. The soil was, however, known to be, as a rule, exceedingly fertile, needing only a regular supply of water to render the labour of cultivation extremely remunerative.²

The original estimate for the scheme was sanctioned in 1888, and in the same year the alignment of the main canal and the site of the headworks were fixed. Before, however, matters had advanced further, Major Jacob's report on the extended Lower Chenab Project was received, and in view of the certainty that the returns on that project would be larger and would come in more speedily, it was decided to give it precedence of construction and to hold the Jhelum Project in abeyance until experience had been gained on the former.³

In 1897 when the Chenab Canal was well under weigh, operations were commenced in earnest on the Lower Jhelum. The first thing to be done was the construction down the main line of a central channel of one-quarter the ultimate width, to provide that supply of water which alone could enable the work to be carried on. Once that was done,

¹ P.A.R. 352.

² P.A.R. 355.

³ P.A.R. 356.

progress was rapid, as the engineering difficulties were practically confined to the headworks, where considerable trouble from river floods was experienced. In the winter and spring of 1900-01 no less than three floods, unprecedented for the time of the year, came down the river, causing serious interruption and much damage, both to plant and to the unfinished work. It required all the zeal and energy of those in charge to repair the breaches¹, thus enabling the canal to be formerly opened in 1901.

Many of the branches and distributaries were, however, still incomplete, and as their construction proceeded, it became clear that the benefits of irrigation could be extended even further than had originally been proposed, by bringing a larger area into the scope of the project, and by including in it the existing Shahpur inundation canals, the supplies to which seemed otherwise likely to suffer owing to the proposed withdrawal of water from the Jhelum for the Triple Canals Project then under consideration. The distributary system was, therefore, extended and a new branch, the Shahpur Branch, added². This Shahpur Branch, however, gave rise to unexpected difficulties. The withdrawal of water from the Jhelum had not proved nearly so injurious to the inundation irrigation as had been anticipated and the owners of the private canals in the tract, who were extremely jealous of their proprietary rights, refused to accept any terms of compensation which would permit of the branch being run as a financial success. Government was naturally unwilling to press the owners, against their will, to surrender their rights, and consequently the further construction of the branch was abandoned in 1916 and the money already expended upon it accepted as a loss.³ But the peasantry, as a whole, still continued to demand the re-opening of the branch, a step which would have benefitted all but the private canal monopolists. Their wishes had, however, little chance of a hearing with the early Reforms Government as against the more politically vocal private canal owners⁴.

¹ P.A.R. 357.

² P.A.R. 358.

³ P.A.R. 359.

⁴ A.C.M. 43-4.



LAND AND WATER

CSL

The Lower Jhelum Canal commands a gross area of about $1\frac{1}{2}$ million acres of which 1,160,000 acres are designated as culturable. Of this total Colony. 568,000 acres were Crown waste. In 1919-20 819,000 acres were irrigated, giving a return of 19 per cent. on the capital cost of over Rs. $1\frac{3}{4}$ crores. Colonization began in 1902 and the opportunity was taken to assist the Remount Department by attaching horse-breeding conditions to the majority of the grants. Generally speaking these conditions require the tenant to maintain a mare suitable for breeding Army remounts and give Government the option of purchasing the progeny at a reasonable price, prior to its attaining the age of 18 months, the average paid in 1919-20 being Rs. 200 per head. Up to 1921, 439,000 acres out of an allottable area of 506,000 acres had been allotted, about 240,000 acres of this were either horse breeding grants or had been made over direct either to the Army Remount Department or for regimental stud farms. The whole colony is an extremely prosperous one and Sargodha, the capital is now a large and flourishing town¹.

But all previous irrigation works have been outdistanced by the great Triple Project, the largest The Triple Canals Project. irrigation work executed in India up to date. It constitutes a striking monument not only to the engineering skill of those who were entrusted with its design and construction, but also to the extraordinary farsightedness of the two officers who independently put forward the original proposal for the scheme. Its main object is the irrigation of a tract of country known as the Lower Bari Doab lying between the Ravi and Sutlej Rivers, bounded on the south by the dry bed of the Beas. Since the whole of the winter volume of the Ravi was already hypothecated to the existing Upper Bari Doab Canal, the Sutlej naturally appeared the most suitable source of supply to the area in question. A scheme for a canal with its head at Harike on the Sutlej immediately below the junction of that river and the Beas, was actually prepared and submitted for

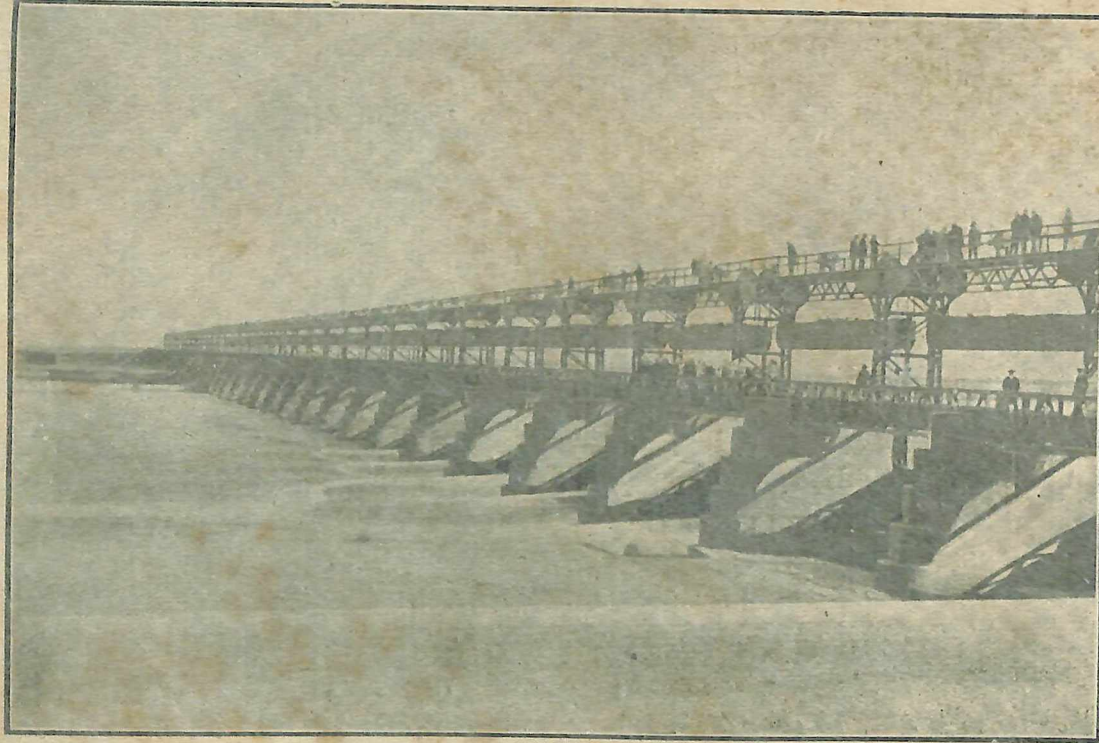
¹ P.A.R. 364.



CSL

1647 feet
long

Impervious
floor for
110 ft.
downstream.



*Steel trestles
18 ft. high
supporting
the operating
platform.*

*35 bays each
of 40 ft. clear
span divided
by piers $7\frac{1}{2}$
ft. wide, 23
ft. high.*

P, 6.

BALLOKI LEVEL CROSSING.

(The Upper Chenab Canal is carried bodily across the Ravi river.)

sanction. It was, however, strongly opposed by two officers whose experience of the central Punjab entitled them to speak with authority, Colonel S. L. Jacob, the designer of the Lower Chenab Canal, and Sir James Wilson, the Settlement Commissioner, an officer who combined administrative ability with a sympathetic understanding of the needs of the ordinary peasant. The waters of the Jhelum were (they contended) much greater than could be utilized in the watershed between the Jhelum and the Chenab and the irrigation of the Lower Bari Doab represented the last possibility of turning them to beneficial use. Moreover the Sutlej water would certainly be required in days to come for the further development and extension of irrigation on either side of the latter river. Their contentions prevailed and resulted in the preparation of the Triple Canals project, which transferred the surplus water of the Jhelum into the Lower Bari Doab and rendered feasible the great Sutlej Valley Canal project destined in later years to advance the line of cultivation far into the heart of the deserts of Rajputana. Had the Sutlej water been taken into the Lower Bari Doab, development of irrigation in the Sutlej Valley would have been at an end¹.

To effect the transfer of water a regulator was constructed at Mangla on the Jhelum at a point where the narrowness of the river itself rendered the provision of a weir unnecessary. From Mangla the Upper Jhelum Canal carries the Jhelum water into the Chenab, discharging it into the latter above the headworks of the Lower Chenab Canal at Khanki. The Lower Chenab Canal is thus fed with Jhelum water and the Chenab water so freed is taken from a new headworks situated at Marala, 36 miles above Khanki, into the Upper Chenab Canal, the second link of the Triple Canals. This canal runs southwards to the Ravi, which it crosses on the level at Balloki, below which it is known as the Lower Bari Doab Canal².

¹ P.A.R. 365.

² P.A.R. 368.

Of the three sections the Upper Jhelum Canal must, as an engineering work, be given pride of place. The head regulator, which has to deal with a river 51 feet higher when in flood than at low water, is a massive dam rising 69 feet above the canal bed, and 96 feet above the lowest foundation level. There are 20 vents in it, each of 12 feet clear span, with piers six feet wide between, the regulation of water being effected by three tiers of gates working one above the other. The canal is there 150 feet wide and for the first 1,600 feet of its course traverses a cut whose maximum depth is 110 feet. It runs for 62 out of the 89 miles of its length along the slope of the Pabbi hills, passing in quick succession through deep cuttings and over high embankments which cross the whole of the drainage of the range. In all no less than 60 drainages cross the alignment, which are dealt with by level crossings, syphons, culverts, or inlets, as the circumstances of each dictate¹. One of the most formidable of these is the Bhimbar torrent with a flood discharge of 35,000 cusecs² which crosses the canal alignment in the 83rd mile. After a careful consideration of all the circumstances, it was decided to divert this formidable river into the Chenab in a combined channel carrying the canal supply also. The width of the excavated channel is 1,000 feet, but the banks have been set back so as to make a width of 1,300 feet available for floods.

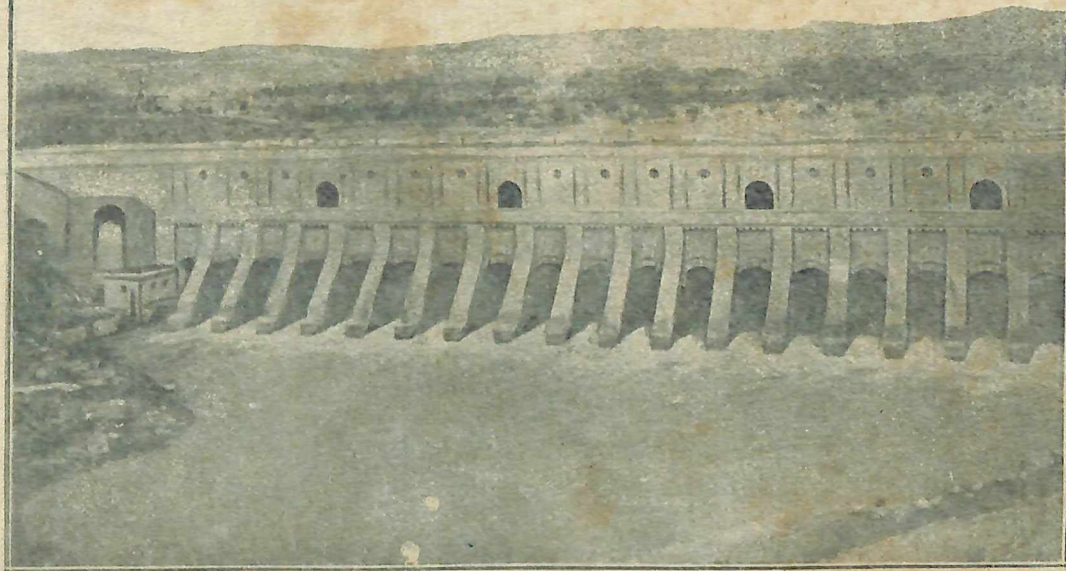
The Upper Chenab Canal is the largest perennial irrigation canal in the world. Its head is at Marala, where the Chenab is spanned by a weir 4,076 feet long upon the crest of which are fitted falling shutters, 6 feet high. On the right flank of the weir are the undersluices, consisting of eight spans, each 31 feet in width and at right angles to the undersluices is the head regulator of the canal with 12 spans, each 24½ feet wide. The canal is 240 feet wide and 11 feet deep at its head with a full discharge of 11,700 cusecs. In the twenty-seventh mile it trifurcates, the Nokhar Branch being thrown off on the right and the

¹ P.A.R. 367.

² P.A.R. 368.



CSL



*Kashmir
hills.*

*Each of these
vents is 12
feet span,
with piers 6
feet wide
between.*

P. 5.

HEAD OF UPPER JHELUM CANAL.

(The dam is 69 feet above the canal bed, and is 150 feet long.)

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Raya Branch on the left, the main canal proceeding southwards towards the Ravi. There are twelve drainage crossings in the portion of the canal above the trifurcation, the works provided for which are noteworthy on account of the extensive use which was made of reinforced concrete in their construction. Between the seventieth and eightieth miles a group of drainages known as the Degh, had also to be negotiated. Their combined discharge is 35,000 cusecs, and in order to obviate an additional number of expensive crossings the whole Degh stream was diverted into the Ravi by means of an artificial cut with an embankment on its downstream side, the cut being thus open to the main drainage channel and to any surface spills that may occur. Of all the large canals this is perhaps the least successful. Banked up above the level of the surrounding country the canal leaks water all through its course and the resulting waterlogging is aggravated by the interference with the natural drainage channels which its artificial alignment entails. Land on this canal has no longer any attraction for its owners, who endeavour, by hook or crook,¹ to exchange their lots into fairer grounds and pleasanter places.

The spanning of the Ravi by means of a level crossing gave rise to the largest work of its kind yet constructed. The Lower Bari Doab Canal. The Balloki level crossing comprises an inlet, combined with the tail fall of the Upper Chenab Canal, a barrage across the river, and the head regulator of the Lower Bari Doab Canal on the other side. The barrage is 1,647 feet long and consists of 35 bays each of 40 feet clear span, divided by piers $7\frac{1}{4}$ feet wide. An impervious floor stretches for 205 feet upstream and for 110 feet downstream of the gates. The piers which are carried on wells sunk 18 feet below the floor of the barrage rise to a height of 23 feet in solid masonry and upon them steel trestles, 18 feet high, are erected to support the operating platform which carries the machinery and gearing for raising the gates. The work is designed to pass the flood discharge of the Ravi

¹ This is not so very difficult nowadays when the supervision over the subordinate revenue staff is nil.

computed at 150,000 cusecs with a freeboard of 5 feet. The head regulator of the Lower Bari Doab Canal on the left of the barrage, has 15 bays, each of 20 feet clear span. The Lower Bari Doab Canal is 195 feet wide and carries a discharge of 6,750 cusecs. Though the main line is 134 miles long, there is only one major drainage crossing, at the twelfth mile.

The original estimate of the project was sanctioned in 1905 and operations commenced simultaneously on all the canals in that year. As was inevitable in the case of work of this magnitude, an enormous amount of detailed investigation had to be undertaken before the final arrangements could be settled and means had to be devised to meet the unexpected conditions which presented themselves. Under the circumstances, the time taken to complete the work was not unduly long. Each section of the scheme was opened as soon as practicable, the Upper Chenab Canal in 1912, the Lower Bari Doab Canal in 1913 and the Upper Jhelum Canal in 1915. The whole work was not, however, fully completed until 1917. It now consists of 433 miles of main canals and branches and 3,010 miles of distributaries.¹ The total area commanded by the project is four million acres, 1,675,000 acres being irrigated annually, of which 345,000 acres are on the Upper Jhelum, 480,000, acres on the Upper Chenab and 840,000 acres on the Lower Bari Doab Canal.² The total cost of the project is now estimated at Rs. 10·6 crores, on which an eventual return of nearly 8 per cent. is anticipated. This, however, is merely that portion of the return which will accrue to the State in a measurable and direct form, and in no way represents the vast indirect benefits which will result from the scheme. The value of the crops which were raised on land irrigated by the system in 1919-20 was estimated at no less than Rs. 9 crores, the bulk of which was a new addition to the wealth of the province, and nearly 2,500 square miles of waste land was then, for the first time, brought under the plough.³ Of the area commanded, 1,570,000 acres were classed as Crown

¹ P.A.R. 371.

² P.A.R. 372.

³ P.A.R. 374.

waste, 43,000 acres being on the Upper Jhelum, 85,000 acres on the Upper Chenab and 1,442,000 acres on the Lower Bari Doab. Of this area 1,490,000 acres were available for allotment. Colonization went steadily forward and 880,000 acres had been allotted by 1920, including areas reserved for horse-breeding and other purposes.¹

III.—FUTURE PROJECTS.

“In thirty years we have increased by nine million acres the canal irrigated area of the Province, within the next few years we hope to add another million, even so we shall be far from completing the exploitation of all our sources of supply. After that comes the great problem of the conservation of the surplus summer flow of our rivers, the solution of which is essential to the welfare of the south-east of the Province.”

SIR MALCOLM HAILEY.²

The Suttlej Valley Project is the direct outcome of the great Triple Canals Project. In that valley, on either bank of the Suttlej, both in the Punjab and in the Indian State of Bahawalpur, a long series of inundation canals drew their supplies from the river, whenever the water level was high enough to permit of it. These canals were liable to all the drawbacks which invariably attend inundation irrigation. There were no weirs at their heads and, in many cases, no means of controlling the water entering them, so that a constant flow of water was normally only assured between May and September, the supply being subject to serious fluctuations at other times. In a year of inferior rainfall little water entered the canals, in a year of high supplies they were liable to grave damage by floods. But in spite of these handicaps, these canals irrigated an average area of no less than a million and a half acres,³ and the first object of the Suttlej Valley Project was, by the provision of weirs and head regulators, to afford to these canals a controlled supply from the beginning of April to the middle

¹ P.A.R. 273.

² Speech at the opening of the Punjab Legislative Council in 1925. P.A.R. (1924-25) 118.

³ P.A.R. 375.

of October, securing them from the detrimental effect of seasonable fluctuations in the water level and thus converting them from the status of inundation to that of non-perennial canals.¹ The areas irrigated by the existing canals would moreover, be extended so as to embrace the whole low-lying area in the river valley. Again perennial irrigation, that is to say irrigation throughout the year, would be given to large tracts in the uplands on either bank, in the Punjab on the north and in the States of Bahawalpur and Bikaner on the south, tracts which were then entirely unirrigated and uncultivated in consequence of the very low rainfall. The system of dividing the irrigation into perennial and non-perennial, ensures the best use being made of the water available. Only 7,000 cusecs are available during the cold weather, when supplies are low, whereas a maximum of 48,500 cusecs will be drawn off during the hot weather and monsoon when water is plentiful owing to the rainfall in the catchments of the rivers, and the melting of the Himalayan snows.²

The projects consist of four weirs, three on the Sutlej and one on the Panjnad, as the Chenab is called below its junction with the Sutlej, with twelve canals taking off from above the weirs. This multiplicity of weirs and canals indicates the immensity of the whole scheme which is made up of four interconnected systems, each of the first magnitude. Each weir will control about one and a quarter million acres of irrigation, the total annual irrigation from all the weirs being nearly thrice that contemplated under the Triple Canals Project, so far the largest system constructed in India. In order to obviate the loss of water entailed in carrying small supplies in very large channels, separate canals have been provided for the perennial and non-perennial irrigation, the original inundation canals being linked to the latter.³

The total cost of the Project is now estimated at about Rs. 22 crores. The total area to be irrigated amounts to

¹ i.e., canals to which a supply of water is assured during the hot weather and monsoon, though they are closed during the cold weather, when the river is low.

² P.A.R. 376.

³ P.A.R. 377.



5½ million acres, of which 2 million acres are in British territory, 1½ million of which will be irrigated in the hot weather only, and ½ million acres throughout the year. The profit to be made will accrue not only from the water-rates but also from the sale value of the land, hitherto valueless Government waste.

The Sutlej Valley Project will soon be a project no longer. The Thal Project. The opening of the Suliemanke weir on the Sutlej by the Governor¹ in 1926 marked the close of the first stage in its progress towards completion. But a great white space on the green of the irrigation map marks the fact that the Thal desert between the Indus and the Jhelum has not yet been conquered, and that the Indus, alone of Punjab rivers, remains unharnessed by its own province. There is a proposal to water two million acres (out of the five that are available) from a weir near Kalabagh. This scheme, was considered by the Punjab Government as far back as 1871, and was only held up in favour of more remunerative schemes. The Sukkur Barrage scheme, under which the Bombay Government proposed to dam the Indus in Sind, only came forward as a definite project at a somewhat later stage. During the discussions which took place over the Sukkur scheme, it emerged that there was some doubt whether the supplies in the Indus would be sufficient both for this scheme and the projects which were under contemplation in the Punjab; and Punjab engineers felt at the time, and have not failed to repeat since, that sanction should not have been given to the Sind Project until that doubt had been determined. Sanction was, however, given, with the practical result of giving Sind a lien on the supplies for which credit was taken in the scheme. If subsequent investigation into discharges should result in showing that supplies are insufficient both for Sind and for the Punjab developments, then the shortage will fall on the latter and the irrigational expansion of the Province may be curtailed, if not entirely

¹ Sir Malcolm Hailey. Lord Irwin, the Viceroy, who was to have performed the ceremony, unfortunately fell ill.

barred. Detailed estimates for the Thal Project await the sanction of the Government of India and a smaller project (the Pind Dadan Canal) is also before them. But as each project comes forward, it is apparently doomed to be barred by objections from Bombay that the Sukkur scheme may possibly suffer from its execution. The Punjab engineers claim that they have figures which will show that if water is utilized in Sind on the ordinary standards applied in the Punjab, there will be enough both for the Sukkur scheme and for their own developments and they hold that the matter should be submitted at once to the investigation of independent experts. The Sukkur scheme will not be completed for many years, it is vital to the interests of the Punjab that its development should not be checked because Bombay is anxious about the ultimate success of its Sukkur scheme, or hesitates to face the opinion of outside experts as to the application of the most economical standards in the use of available supplies of water. Signs are not wanting that the attitude of the Bombay Government is due to a nervous anxiety as to the future of their pet project, fearful as they are lest it prove another Back Bay¹ scheme.

The actual plans of the Sukkur scheme have, from the first, been vigorously attacked on technical grounds by one school of Bombay engineers. The soil which it will irrigate is much closer in texture than that of the Canal Colonies of the Punjab, there are no deep sand layers to assist percolation, and the level of the subsoil water is comparatively near the surface. There is, therefore, every reason to fear that the soil conditions of the area commanded by the Sukkur barrage are such that intensive perennial irrigation will produce a vast expense of dead alkali land². Be this as it may, the Punjab may reasonably claim that the inferiority complex of the Bombay Government should not be allowed to become the decisive factor. The Punjab came

¹ A scheme for filling in, at vast expense, portions of Back Bay to the west of Bombay city. The scheme proved a ruinous failure, and was only partially carried out.

² *A.J.I.* (May 1926) 178.



early into the field, when the introduction of perennial irrigation in Sind was still a matter of controversy and discussion; the energy of Punjab engineers gave to their Province the great perennial canals on the Sutlej, the Chenab, the Jhelum and the Ravi. The Punjab must not now be penalized for the energy and decision it has shown in the past, nor its people deprived of such use of the water of the Indus and its distributaries as independent, scientific advice shews to be possible.

Another weir will one day (D. V. and the Bombay Gov-

The Haveli ernment permitting) be constructed at Haveli Project. to use the water of the Chenab below its confluence with the Jhelum. The water supply will only be the seepage from the other canals above, which percolates back into these two rivers. But it is an amount worth capturing, and the weir will send bigger supplies out in the summer. The project which is expected to irrigate $\frac{3}{4}$ million acres and to yield a return of 6 per cent. on a capital outlay of Rs. 2 crores can only be taken up after the Panjnad weir of the Sutlej Valley Project is built.

The above projects merely provide for diverting the ordinary flow of the rivers into channels whence The Bhakhra Dam and other Projects. it can be used for irrigation, they make no provision for the utilization of the enormous surplus available when the rivers are swollen by the melting Himalayan snows in summer. The Sutlej Valley Project is based on a minimum expectation of 6,500 cusecs, and the river flow has fallen below this in dry winters, yet 400,000 cusecs went down in flood just as the Suleimanke weir was reaching completion. The sea does not want this surplus water, but there is plenty of arid land that does; and it is for the impounding of some of it that the Bhakhra Dam on the Sutlej is designed. The dam first proposed was to be 395 feet high to hold up a lake with a capacity of $2\frac{1}{2}$ million foot-acres, which is sufficient to give 6,000 cusecs for 200 days in the year. A bigger scheme contemplates making the dam a hundred feet higher (495 feet in all) and storing

river below Phillour, from which point a new canal will be $4\frac{3}{4}$ million foot-acres. The lesser scheme would add $1\frac{3}{4}$ million acres to the acres irrigated by the Sirhind Canal and by taking some of the work now done by the Western Jumna Canal it would enable the latter to irrigate another half million acres. This involves the enlargement of the existing Sirhind Canal and the construction of a weir on the Sutlej constructed to take a portion of the irrigation of the existing Sirhind Canal. A new channel will be constructed from the tail of the Main Line of the existing Sirhind Canal, across to the Sirsa Branch of the Western Jumna Canal which will in future be fully supplied from thence. The supply in the Western Jumna Canal thus set free, the Sirsa Branch will be utilized for the irrigation of all the unirrigated land southwest of the Western Jumna Canal. The project is estimated to cost about $14\frac{1}{2}$ crores to give an increase of irrigated area of over two million acres, and to yield a return of 7 per cent. on the capital outlay.—The magnitude of this project may be judged from the fact that the Assuan Dam across the river Nile in Egypt impounds only 36,000 million cubic feet of water, only three-tenths of the amount to be impounded under the lesser Bhakhra Dam Scheme¹.

Under this scheme irrigation will be extended, irrespective of territorial boundaries, wherever physically possible in the tract between the Sutlej and Jumna rivers, excluding the submontane tract, which may, however, be subsequently irrigated by means of tube-wells if sufficient water power is developed by the project. A much smaller project of the same nature is the Wular Lake Barrage Project which provides for the construction of a barrage on the river Jhelum at Sopor, just below its exit from the Wular Lake in Kashmir, the project being to impound water in that lake during the summer, for use in the winter by the Punjab Canals. offtaking from the Jhelum and the Chenab rivers. This project still forms the subject of negotiation with the Kashmir State Government².

¹ P.A.R. 381.

² P.A.R. 382.



The Ravi could also apparently be headed up at Thain, in a reservoir for the use of the Lower and Upper Bari Doab Canals, thereby increasing their cold weather supply by 20 per cent. with presumably the power to take double the amount in the summer. Much might also be done with the tributaries of the great rivers. The Degh is an absurd channel which runs through Gujranwala. A narrow miserable stream in the winter, in the summer it comes down in great spates, rendering necessary long causeways on the Grand Trunk Road, and causing waterlogging in various areas watered by the Upper Chenab Canal. A good proportion of its run-off could be held up within the hills and let down quietly as required, thereby substituting an irrigational canal for a periodically destructive torrent. The Chakki torrent is familiar to travellers to Dalhousie and Dharamsala. Its bed is merely sand and boulders for much of the year, but at intervals it becomes a raging stream which does much damage in Gurdaspur and at the headworks of the Upper Bari Canal. If, as believed, it can be dammed with success, the holding up of the waters will also have a double value in utilizing an element which is now purely destructive.

IV.—COLONIZATION.

“ I will tell a new tale to-day.
How of old the Bar¹ was the prey of thieves.
The shelter of deer, jackals and rats,
Now no barren jungle is left,
Young Sahib² has peopled the land.”

*Punjabi Ballad.*³

The Punjab Canal Colonies. In its strict etymological sense the Punjab, or the Land of the Five Rivers, is the country enclosed and watered by the Jhelum, Chenab, Ravi, Beas and Sutlej, though the Province, as at present constituted, includes also the tableland of

¹ The upland between two rivers.

² Captain (now Sir) Popham Young, first Colonization Officer, Lyallpur.

³ Quoted in Darling 128.



Sirhind, south of the Sutlej, and the so-called Sind-Sagar watershed, the wedge of country lying between the Jhelum and the Indus.¹ With the single exception of Sind, there is no portion of India which is so favourably situated as regards its rivers or so unfavourably as regards its rainfall as this Land of the Five Rivers.² By far the greater portion of it has less than 15 inches a year and much of it less than ten. When it is remembered that even these small amounts are liable to serious deficiency in a year of drought, it will be readily comprehended that until the introduction of irrigation, practically the whole vast stretch of country was desert waste. The only exceptions were the fringes of the rivers where cultivation, though never very prosperous, was rendered just possible by means of inundation canals and wells.³ The problem which confronted the Punjab Government in this case was quite different to any which had previously had to be faced. In all other irrigation schemes, with the single exception of the Lower Swat Canal, the main object had been the improvement of existing cultivation. The cultivator had been in occupation long before the canals were even projected. But in the Punjab desert or Crown Waste tracts as they were called, there was no resident population beyond a few nomads who eked out a precarious existence as graziers, and simultaneously with the introduction of irrigation it was therefore necessary to transport bodily whole communities into the new areas thus opened up.⁴

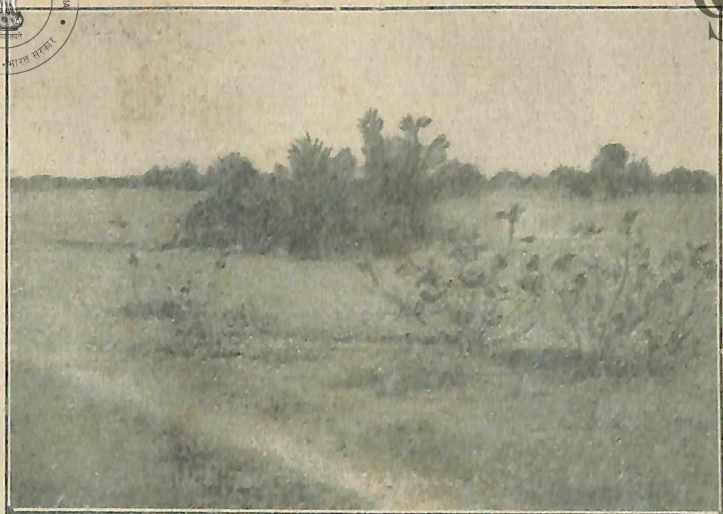
To meet those special problems a specialized staff under The Colony a Colonization Officer was required for each Staff. colony, separate from and independent of the ordinary district administration staff. The size of such a colony staff naturally depended on the magnitude of the operations to be carried out. In view of the gain, financial and administrative, to be secured by the speedy development of a colony, to cut down the superior staff was the falsest economy. No Colonization Officer could expect to

¹ P.A.R. 320.

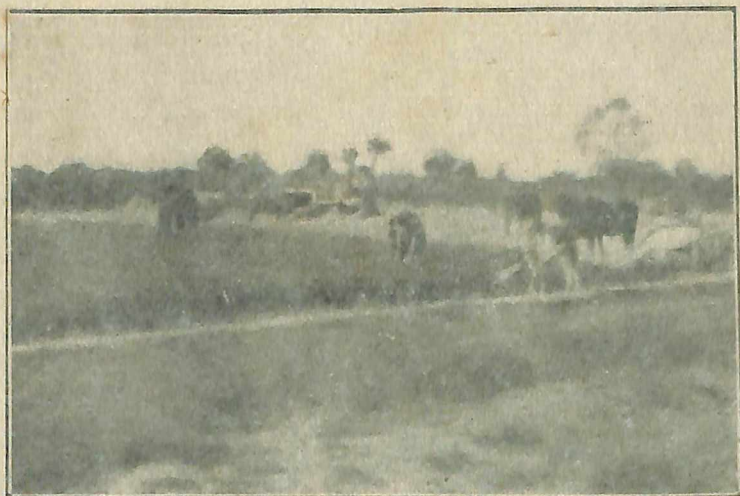
² See Map I.

³ P.A.R. 321.

⁴ P.A.R. 322.



Typical Colony tract before irrigation.



Typical colony tract after irrigation.



be anything but a very overworked man, but he required sufficient leisure from the petty details of administration to enable him to look ahead and plan out the lines on which the colony was to develop. This he could only do if he had a staff strong enough and competent enough to keep running at a proper pace the machine which it was his task to guide. The Lower Chenab Colony suffered considerably from the grave inadequacy of the staff sanctioned.¹ The exact amount of independence given to a Colonization Officer depended on local circumstances and administrative convenience, but, whatever the status temporarily assigned to him, the fixed aim of Government's policy was the ultimate unification of authority by the absorption of all colony administration into the ordinary duties of the head of the district. Colonization work bore this resemblance to settlement² work that both were entirely extraneous to the ordinary district administration. Just as the land revenue administration is largely transferred from the Deputy Commissioner to the Settlement Officer during the progress of settlement and in due course retransferred, so, too, in the case of colonization work. The establishment of new colonies on waste lands is a work apart from ordinary district administration. But once the colonies have been planted and have reached a healthy growth, their management, like that of older estates, should follow the lines of ordinary routine.³

“ In the first selection of colonists Government had two main objects in view. Primarily it was desired to relieve the pressure of population in the highly congested districts of the Central Punjab, where conditions in the nineties were even worse than they are to-day. Secondly, it was designed to create villages of a type superior in comfort and civilization to anything which had previously existed in the Punjab.” Upon this twofold basis arose the Lower Chenab Canal Colony, which now embraces 2½ million acres.⁴ It is of the first importance

¹ C.M. 285.² C.M. 287.³ p. 206.⁴ Darling 134.

LAND AND WATER.

to the success of any scheme of colonization to make adequate provision for the indigenous inhabitants of the tract to be colonized and for the introduction of immigrant peasant colonists of a suitable type. The reservation of land for sale by auction is also important.¹ It is a comparatively easy matter to ascertain for what classes of the indigenous population provision should be made in any scheme of colonization. It is less easy to decide how far the claims of the indigenous population should take precedence over or be subordinate to other interests for which it is the general policy of Government to provide. The nomad tribes of the Punjab uplands² are an extremely prolific race, and the policy of proportioning their grants rather to their prolific qualities than to their existing needs is one which should always be followed if their hostility to immigrant settlers is to be overcome and they are to be induced to substitute agriculture for grazing as a means of livelihood. It would, therefore, appear to be desirable in all cases to investigate the claims of the local inhabitants of a tract about to come under colonization as an essential step preliminary to the formulation of any scheme of colonization.³

“ Colonists from outside fall broadly speaking into three categories (1) the small peasant proprietor who is given a square of land,—in Shahpur he has been given two squares to enable him to maintain a brood mare, (2) the yeoman farmer who receives four or five squares, and (3) the landlord, the representative of the landed gentry, who may get anything from six to twenty squares. Of these, the peasant proprietor is much the most important. He is the backbone of the colonies, as he is of the Punjab.”⁴ The choice of peasant colonists is left, in the main, to the revenue officers of the districts from which they are drawn. For colonization aims not only at opening up new areas, but also at relieving pressure upon the land in those parts of the Province where the agricultural population is approaching the limit which the land available

¹ C.M. 68.

³ C.M. 80.

² Bar.

⁴ Darling 136.

can support. It is from these congested districts that the colonists are chosen, only members of agricultural tribes who are either hereditary landowners or occupancy tenants being ordinarily eligible for the so-called peasant grants under which the bulk of the land is allotted. Selection is usually made personally from each village by the district officer concerned and is by no means an easy matter. From the mass of applicants the ineligible must be weeded out—dotards and mere boys put forward in the hope of securing an extra square for the family, those who have already sufficient holdings, those who have mortgaged a considerable share of their land, the physically and mentally unfit, the village loafers and the like. When this has been done there remains a band of men, all connected by common ties and, to a large extent, by common descent, all short of land but all physically fit and with sufficient resources to start life in a new country under considerable initial difficulties. Groups of this nature are despatched to the colonies as a unit, each group being of about the size required to form the nucleus of a new village, and in this way they all start at the same time and bring with them, ready made, the elements which go to form a separate village community. The weaker ones can get help in the shape of loans, cattle and seed from those better off, and the village is, therefore, far more suited to face the hardships inevitable in the first months of immigration than it would be were it built up from isolated individuals, none of whom knew or trusted his neighbour and between whom there was no cohesion of any kind.¹

There were many other forms of grant designed to suit the special circumstances of the grantee or of the tract to be colonized. Grants larger than the ordinary peasant grant were made to so-called "yeomen"—hereditary landholders of more substance and of better social status than the ordinary cultivator,² amongst whom were some of the most intelligent and enterprising men in the agricultural community. Such men have

¹ P.A.R. 325.

² P.A.R. 327.



good credit and resources, and if they can be attracted to the land form most useful members of a new colony.¹ When they cultivate their land themselves, there is no better medium for the spread of agricultural progress.

Still larger allotments were sometimes conferred on men of means willing to experiment in improved methods of cultivation and irrigation. Capitalist farming in general is not a system suitable to the Punjab. But a moderate infusion of the capitalist element is not without advantages. It supplies natural leaders for the new society. It gives opportunity to Government to reward its well-deserving servants and to encourage the more enterprising of the provincial gentry. It attracts strong men who are able to command the services of considerable bodies of tenants. It furnishes a basis from which agricultural improvements may be hereafter extended and lastly, it enables Government to obtain a better price than might be otherwise possible for the ownership as distinct from the user of its lands.²

“ Colonization was well under weigh when the outbreak of the South African War in 1899 brought Service grants. the needs of the army vividly to the fore. It was feared that, if ever India became involved in a great war, the supply of horse, mule and camel might fail. Accordingly it was proposed that land should be given to those who would undertake to maintain mares or camels for breeding purposes.” This object was dominant in the Lower Jhelum and Lower Bari Doab Canal Colonies, and in the former over 200,000 acres were given out on horse-breeding conditions. “ Latterly the conditional grant has been developed even further, and is now applied to the most heterogeneous schemes ‘ each devoted to one object dear to the heart of some particular department of Government.’ Lands have been given for the growth of selected seed, for the breeding of special strains of cattle, for the supply of cantonments with milk or butter, for plantations and experiments in fruit farming, and even for the introduction of

¹ C.M. 111.

² C.M. 111.



steam ploughs. The modern colony, therefore, is made not only to serve the primary needs of life, but also to supply the requirements of the army and to develop a high standard of agriculture, and in the grants that have been made to societies for the depressed classes and criminal tribesmen there is even a hint of the reformatory. It is too soon to judge the results of most of these experiments. Some have led to hot controversy, and others, for instance, the grant of land for the breeding of camels, have definitely failed.

In the Lower Jhelum Canal Colony, which is based upon the horse-breeding grant, the grantees have been tied down to a system of primogeniture, which is entirely foreign to the Punjab and sometimes leads to the "murder of the eldest son."¹ This colony is seriously handicapped by the fact that the conditions imposed by the Government of India in the supposed interests of horse-breeding are detrimental not only to good agriculture but also to good administration, while at the same time inflicting a heavy tax on the resources of the Province. The increased value which the land would acquire if these burdensome conditions were removed would suffice to pay many times over for the establishment of a large Government estate devoted to horse-breeding alone. The definite refusal of the Government of India to release the occupants from these onerous conditions is typical of the Simla bureaucracy at its worst.

More interesting from the point of view of rural economics are the grants for agricultural development, large areas of land being let out to those who would agree to follow the fads of the moment. With a few exceptions these grants have merely been the cover for a peculiarly unpleasant form of favouritism characteristic of the Reforms epoch, the grantees thereby getting long leases of vast areas of land on conditions which, light though they were, they hardly ever thought of fulfilling, and which, to do them justice, Government itself merely regarded as a convenient excuse for these otherwise unjustifiable bestowals.

¹ *Darling* 135.



Such favouritism is impossible in the case of sales by

Auction sales and absentee landlords. auction, from which Government obtained over Rs. 2 crores in the Lower Bari Doab Colony alone. Sale by auction is intended to

secure three objects, firstly a more speedy return of some of the vast capital expenditure, secondly, an opening for non-agriculturists, and the presence in the colony of an element other than the peasant colonist, and, thirdly, an indication of the value of colony land in the open market. The first object is undoubtedly attained. The third object may be said to be attained in part, but it should be noted that the prices paid at an auction are not usually a safe indication of what the ordinary peasant is prepared to give. As to the second object, sale by auction does certainly provide an opening for non-agriculturists, but the capitalist who buys the land no more becomes a resident than any other man of his class who has acquired his land in other ways. Large auction purchasers are invariably absentees, and as such, of not the slightest use to the colony, though in fairness it must be said that their estates are supervised more thoroughly than those of the landed gentry and reward grantees.¹

“But revenue may be obtained at too great a cost, and if these auction sales bring in the absentee landlord in large numbers, the ultimate loss to the colony may be greater than the immediate gain to the exchequer.”² “Next to war, pestilence and famine, the worst thing that can happen to a rural community is absentee landlordism.”³ No less than 29 per cent. of the land in the Lower Bari Doab Colony is held by persons who need not reside there unless they wish and whose only interest in the colony is the amount of money that can be got out of it. The best Punjab type of agricultural community, which it is Government’s aim to reproduce in the new colonies, does not include the absentee landlord.⁴

It now remains for Government to determine whether, when land becomes available for cultivation under the Sutlej

¹ C.M. 102.

² Darling 139.

³ Curver 377.

⁴ C.M. 70.

Valley Project, the same difficulties and problems as in the past are to arise in connection with the placing of a mixed population in those areas, or whether, by wisely enquiring into the success with which the existing principles have worked, a great deal of future trouble might not be averted by relevant reforms. Thus, in the selection of the colonists, it might be possible to lay down a stricter policy of settlement according to class and occupation. Greater encouragement might be given to the educated classes to obtain holdings. Attention might also be paid to the elimination of "village Shylocks," the more rigorous enforcement of the terms on which grants are made, the opening up of wider occupational opportunities, the more judicious regulation of reserve prices at auctions, and many other special questions which have arisen in the course of the last decade.¹ The Punjab Government, has, in fact, been acquiring experience of colonization problems since the year 1886, when the Sidhnai Colony was established in the Multan District. With forty years of experience to draw upon, it might reasonably be expected that—great as have been the achievements of the past—an enquiry to-day would afford the means of ensuring an even greater measure of success in the gigantic colonizing enterprises of the morrow.

Prior to the construction of a canal and with a view to determine the approximate position of the *Killabandi*. main line and branches, the tract to be colonized is divided up into large squares or rectangles, each of them a multiple of the smaller square or rectangle into which the land is subsequently sub-divided for the purpose of allotment. These large squares or rectangles form the basis of the original level survey of the canal. The whole tract is, in this way, demarcated into equal and regular areas, the shape and size of which have varied in the several schemes.² In the Sidhnai Colony the area of the squares was $22\frac{1}{2}$ acres, for the Lower Sohag, Lower Chenab and Lower Jhelum Colonies the village accountant's survey square of $27\frac{7}{9}$.

¹ i.e., 1915-25.

² P.A.R. 323.



acres was selected : the vast area was demarcated into such squares and the irrigation arrangements provided a water supply for each square to be cultivated. It was intended to allow the grantee to arrange his fields as he pleased within his grants, but a lucky chance led to the issue of orders, that all squares should be divided into 25 sub-squares which thus contained an area of one acre and 18 poles. The manifest advantages of this system led to its immediate acceptance, and the sub-squares were called *killas* and the system *killabandi*. But on the canals of the Triple Project in place of the survey square a rectangle of 1,100 × 990 feet containing 25 acres was adopted, providing *killas* of one acre each, and thus avoiding the calculation of all rates in terms of *killas* as well as of acres.

One of the advantages of *killabandi* lies in the simplicity of the mapping work required for the cadastral map, which then, to a large extent, consists of straight lines drawn across the map ; and in the consequent ease with which the map can be kept up-to-date. This is fully recognized not only by the record staff, but by the cultivators themselves, and led to the introduction of *killabandi* into proprietary areas irrigated by the Lower Chenab and Lower Jhelum Canals. Here *killabandi* involves a complete re-partition of the village area according to the share of each proprietor. This is simple enough in the large estates in the uplands with few owners and much waste land, but in the lower and more developed villages towards the rivers, entails a considerable amount of minute attention to detail. The advantages of the completed work are, however, so patent that the trouble of the re-arrangement has been cheerfully acquiesced in : and the system is being introduced into proprietary areas on the canals of the Triple Project. An experiment on the same lines in the Western Jumna Canal area in Karnal was not popular with the more conservative owners of the south of the Province, and was therefore abandoned. ²

¹ One side of which was 200 *qadams* of 66 inches each. (See Appendix XVIII.)

² P.A.R. 253.

In a colony tract the alignment of the watercourse proceeds creation of holdings; and consequently it is possible to make the boundaries of each group of allotments coincide with the boundaries of the area commanded by the watercourse from which the group is irrigated. For this purpose, a contoured map of the tract is first prepared showing the natural drainages, and the area commanded by one or more such watercourses is constituted into a village. Thus are avoided the dangers to peace and order which would ensue if two villages shared one watercourse. The village boundaries having been settled and the general lay-out of the settlement determined, the main streets are demarcated and land is set aside in the vicinity, for grazing grounds, for the accommodation of village servants, and for community purposes such as tanks, tan-pits or manure heaps. All this is done before the colonists arrive. They find the village sites ready for them, and have only to build their houses and commence breaking up their land. The colony villages thus methodically planned, possess marked sanitary advantages over the ordinary Indian homesteads. ¹

Once the grantees are established in their new villages, development proceeds apace. The alignments of the necessary communications, connecting village to village and the villages to the boundary roads which run parallel to the canals, have already been demarcated, and on these alignments village roads come into being. The increasing harvests demand increasing facilities for transport. Metalled roads and railways make their appearance, and upon them towns and markets spring up. Viewing a typical colony tract, flourishing as but few parts of India flourish, it is almost impossible to believe that only a few years previously it may have been a barren, waterless, uninhabited desert. ²

¹ P.A.R. 324.

² P.A.R. 328.

Not the whole of the village area, however, is available for cultivation. Apart from the space required for roads, village sites, brick-kilns and grave yards, a considerable area (amounting in the Lower Chenab Colony to 20 per cent. of the total area) is reserved for grazing.¹ The original idea was that this *quasi* village common would form a compact block in the village. This would be flooded with surplus water, which would otherwise run to waste, and so provide grazing for cattle. Estates allotted to capitalists were from the first an exception to this rule, the idea being that the broad acres of such grantees were sufficient to provide for their own requirements.²

In practice, however, there is no extra supply of water and in any case the trend of expert opinion is against irrigated pasture. It is a more economical use of water and land to raise fodder crops and stall-feed cattle. Accordingly this reserve usually consists of the highest and the worst land. It provides little or no grazing, and is not much more valuable as a fuel reserve, no attempt being made to preserve the few trees that have survived. It is, however, now realized to be fortunate, from a sanitary point of view, to have round the village site a strip of unirrigated land unencumbered with vegetation. But this need not necessarily involve the permanent withdrawal from allotment of 10 per cent. of the village, much less of 20 per cent. Once proprietary rights have been given and exchanges are a thing of the past, the reservation of a space half a square in width round the square reserved for the village site³ will provide in ample measure the exercising ground required for a man or beast.⁴ In practice, therefore, this grazing ground has been treated as a reserve at the disposal of Government, which can thus provide land in exchange for those who are dissatisfied with what they have. For when land is first allowed to a grantee, every care is taken to see that the grantee is satisfied with his allotment and in order to ensure satisfaction he is permitted to exchange the area which has

¹ *chiragah*.

³ *abadi*.

² *C.M.* 338.

⁴ *C.M.* 343.

been allotted to him. This privilege of exchange has always been strictly limited to the time during which the grantee is a tenant and the object is to secure the satisfaction of the tenant before the final purchase is made. Once the final purchase is made there can be no question of exchange. The grantee has obtained very valuable rights over the land, including the right to alienate it. He is now entirely independent of Government control in the matter of his grant. It would, therefore, be unfair to Government to be still held bound by a condition to exchange the land if the grantee subsequently became dissatisfied with his grant.¹

In 1923 attention was drawn to the fact that in most of the colonies there were large areas either commanded² or commandable by the canals which, for one reason or another, had never been colonized. In some places, as on the Lower Jhelum Canal, there had been considerable extensions of irrigation due to remodelling since the completion of the colonization scheme. In others, particularly on the Lower Bari Doab Canal, there were large tracts of inferior land which the regular colonists would not accept, but which were quite fit for cultivation and potentially capable of improvement. On the Lower Chenab again the unnecessarily large proportion of 20 per cent. of allottable land had been reserved for grazing grounds,³ the usual proportion in the peasant tracts of the more recent colonies being 10 per cent. Enquiries into the extent of this culturable unallotted balance⁴ elicited the fact that there were some 100,000 acres or more in each of the Lower Chenab and Lower Bari Doab Colonies, and some 50,000 acres or more on the Lower Jhelum, not to speak of smaller areas in the Upper Chenab Colony. The existence of this large quantity of unallotted land was obviously a waste of the resources of the Province, and incidentally had led to a great extension of the temporary cultivation, which has been described as the curse of the canal colonies. The Governor in Council accordingly decided

¹ C.M. 345.

² Land lying on a lower level than a canal is said to be *commanded* by it, i.e., it can be irrigated by it.

³ *chiragah*.

⁴ *bagaiya*.

that the time had come to dispose finally of all such unallotted lands,¹ and proposals were called for from local officers for its allotment or sale.²

In the process of colonizing large areas of Government Temporary waste lands the introduction of settlers cannot cultivation. always be made to synchronize with the completion by the canal engineers of the water-courses of some particular section of their scheme. The arrival of colonists may be delayed from some accident or be deliberately postponed owing to the lateness of the season. In such cases the lands commanded by the completed water-courses may profitably be given out for what is known as temporary cultivation, (*i.e.*, cultivation by tenants-at-will for one or more harvests only). This serves to utilize water which would otherwise run to waste, to test the working of the system for the distribution of water, and to allow of the cultivation of land which could not be allotted in time for permanent colonists. It also gives employment to the indigenous inhabitants, whether nomads who have not yet got permanent grants of land, or peasant owners in the adjacent river valleys, whose lands are temporarily unculturable through drought. In this way considerable sums accrue to Government from the utilization of land which would otherwise be fallow and water which would otherwise run to waste. The system of temporary cultivation was first tried on the Lower Chenab Canal, and at the outset met with some opposition from the canal authorities, but its advantages were held to outweigh any possible drawbacks. Its drawbacks are obvious. It opens an unequalled field for corruption of every kind and a continuous course of temporary cultivation means that everything possible is taken out of the land and nothing put into it. The temporary cultivator is not going to waste his money on manuring. Prolonged temporary cultivation also in popular estimation establishes a vested interest in the land³ that bugbear of Colonization Officers. Its popularity is due to the low rates

¹ *baquia*.

² *haqq*. C.M. 408.

³ P.A.R. (1923-4) 146.

charged.¹ Good land will easily sell for Rs. 400 per acre, and of a rent of Rs. 30 per acre matured² (inclusive of land revenue but exclusive of water rates³) is not considered excessive for such land. The peasant grantees in the later colonies are required to pay Rs. 100 per acre to obtain proprietary rights. There is, therefore, no justification for a lower rent charge than Rs. 6 per acre matured² on permanent grants, and still higher rates can fairly be charged for temporary cultivation. As a matter of fact land is often taken on this plea when there is no intention of cultivating it, the lessees merely turning on to their permanent grants the water sanctioned by the Irrigation Department for this extra area.⁴

The charges made by the State for the benefits conferred by canal irrigation are of two kinds. Colony Assessments. As a canal owner it charges a water-rate⁵ for the water supplied. This is generally⁶ paid by the cultivator for each field which receives water in a harvest, different acreage rates being charged for different crops. But these rates are far below the economic value of the water supplied, as it is not the policy of Government to exclude landowners from sharing in the profit arising from improvements effected at its expense. For similar reasons Government exercises the power to limit the water-rates levied by private canal-owners, so that there also a margin of profit may be left to the land-owner. In practice, such water rates are much greater than those charged on State canals, but in each case there is an unearned increment left to the land-owner. Now the State, as supreme lord of the land⁷, has a

¹ For *malikana*, i.e., the additional rent charge taken by Government from cultivators, who have not acquired proprietary rights.

² i.e., for each acre on which a crop matures.

³ the tenant pays water-rate but not land-revenue.

⁴ P.A.R. (1922-3) 39.

⁵ Also called occupier's rate, because it is paid by the actual cultivator of the land (who is not necessarily the owner).

⁶ Not always (see below).

⁷ I use this term to indicate the State as exercising its inherent right to land revenue. On State lands where the State is also an ordinary land owner or proprietor (*malik*), a rent charge (*malikana*) is charged which is additional to the water rate (*abiana*) and the land revenue (*muamla*).

right to share in any increase of rent due to any improvement, however effected, whether due to improved communications, to the private initiation of the cultivators, or to the introduction of canal irrigation by its own agency or by private individuals.

The enhanced land revenue assessment claimable on account of the increased land value due to canal irrigation is determined at Settlement. Two alternatives are open to the Settlement Officer. The land may be simply rated as irrigated, no attempt being made to discriminate the portion of the assessment which is due to irrigation. This is the method by which the lands watered by perennial canals were assessed in the earliest British settlements; and the assessments of lands dependent on some of the inundation canals are still of this description. Later the plan was adopted ² of dividing the assessment into two parts, the first representing the revenue claimable from the land in its unirrigated aspect, and the second known as the water advantage revenue ³ arising from the landowners increased profits due to irrigation. This revenue was taken by means of a water advantage rate on the area irrigated at each harvest. The water advantage rate is now no longer imposed in the Punjab, its place having been taken on the Agra ⁴ and Western Jumna Canals by a fixed canal advantage revenue assessed on the area commanded by the Canal. ⁵ The latter system was introduced on the Upper Bari Doab Canal in the districts of Gurdaspur, Amritsar and Lahore when they came under settlement between 1887 and 1892 after the great extension of canal irrigation which had occurred in the previous 20 years. ⁶

There are thus now only two systems of assessment of land revenue on lands watered by perennial canals. The first is the fixed canal advantage rate on area commanded

¹ p. 222 j.

² by Prinsep see *L.F.R.* 262.

³ *Khush haisiyati*.

⁴ The Agra canal is almost entirely outside the Punjab but it irrigates a small area of the Gurgaon district.

⁵ and therefore classed as *nahri*.

⁶ *S.M.* 415.



which has been imposed on the older canals, the Western Jumna, Agra, Sirhind and Upper Bari Doab, and which is based on the cash rent paid on such land. The difference between that rate and the corresponding rate for unirrigated land¹ is used for calculating during the settlements now current (1) the new revenue payable on land made irrigable by canal extensions since settlement, and (2) the revenue to be remitted on land from which canal irrigation has been withdrawn, by remodelling operations or otherwise, since allotment. The second system is the purely fluctuating assessment levied on the area sown on the newer canals, *viz.*, the Lower Chenab and Lower Jhelum Canals and the canals of the Triple Project. For those the fluctuating system is more suitable for two reasons: (i) the assessable value of the land without irrigation is little or nothing and (ii) it is necessary on new canals that the engineers should have a free hand in varying the distribution of water with extensions and improvements, and the simplest method of allowing for variations in distribution is to have an entirely fluctuating assessment.²

In estates where canal irrigation is perennial, and where in consequence the revenue derived from canal land revenue and canal water-rate combined is overwhelmingly greater than the land revenue assessed on unirrigated lands, the assessing agency is the Canal Department. This land revenue is to be distinguished from the water-rate which is also fluctuating and which is invariably assessed by the Canal Department. While the land revenue is fixed on all matured areas, the water-rate charged varies considerably with the crop grown, and is different on different canals. It varies from Rs. 7/8/- to Rs. 12 per acre for sugarcane, from Rs. 4 to Rs. 7/8/- per acre for rice, from Rs. 3/4/ to Rs. 5/4/ per acre for wheat, from Rs. 3 to Rs. 4/4/- per acre for cotton and from Rs. 2 to Rs. 3/4/- per acre for millets and pulses. No extra charge is made for additional waterings. Practically speaking Government guarantees sufficient water for the crop, and gives it as much as can be made

¹ Called the *nahri paria*.

² S.M. 446.



available. If the crop fails to mature, or if its yield is much below normal, either the whole or part of the irrigation assessment is remitted.¹ But though assessed by the Canal Department the water-rates are collected by the land revenue authorities and it is the duty of the Deputy Commissioner in canal-irrigated districts to pay as much attention to the collection of canal dues as he does to the realization of land revenue.²

5.—DISTRIBUTION OF WATER.

The construction and maintenance of all the important canals of the Province is the work of the Irrigation Department. This department is also responsible for the assessment of the water-rate leviable on irrigated land and usually also for the assessment of land revenue on such land when it fluctuates according to the actual area irrigated. This department is administered by three Chief Engineers under each of whom are Superintending Engineers, who control circles formed of one or more canals. These circles are again split up into divisions, each in charge of an Executive Engineer. Each division is further split up into three or four sub-divisions each in charge of a sub-divisional officer. Not only does the department maintain all the canals in its charge, but its officers are responsible for the registration and measurement of the irrigation and the assessment of the revenue levied on it. For canal revenue purposes each sub-division is divided into sections, generally three in number, each in charge of a *zilladar* and each section is again sub-divided into village accountant's³ circles. For maintenance purposes a sub-division is divided into sections in charge of overseers or sub-overseers. The revenue

¹ P.A.R. 396. This power to remit the assessment gives the subordinates of the Irrigation Department ample scope for corrupt practices.

² L.A.M. 542-3.

³ *patwari*, the canal *patwari* is to be distinguished from the ordinary revenue *patwari*.

establishment of a whole division is further supervised by a Deputy Collector. When the supply of water is insufficient, the Superintending Engineer controls inter-divisional distribution and the divisional officer that between sub-divisions. The internal distribution of water and regulation of supply is primarily in the hands of the sub-divisional officers. The *zilladar*, who is constantly in touch with all his village accountants, indents for water at the heads of the distributaries which take off from the canals or their branches. The sub-divisional officer receives reports for all his channels daily and thus controls the distribution. The Executive Engineer supervises the internal distribution by sub-divisional officers and controls the inter-divisional distribution; and a report on the general state of crops is submitted weekly by each Executive Engineer direct to the Chief Engineer, who thus controls generally the distribution throughout the Province. The efficient distribution on Punjab Canals is mainly due to the very extensive canal telegraph system.¹

The headworks of perennial canals are generally constructed at a point up the river, which will give ample command over the area to be irrigated. “The main canals and larger branches follow the ridges or high ground in the plains as far as possible. During the summer the canals generally run full, but in winter, owing to shortage of supply, the various branches and distributaries run in rotation. The adjustment of supplies in the five linked canals, *viz.*, the Upper and Lower Jhelum, Upper and Lower Chenab, and the Lower Bari Doab, is fixed by the Chief Engineer in consultation with the Superintending Engineers. The latter arrange the supplies of the branches and distributaries of their respective canals in consultation with the Executive Engineers.”²

The basis of Irrigation administration is co-operation between Government and the cultivator. Up to a certain point Government retains control; beyond that point

¹ P.A.R. 390; *Gazetteer* 126-7.

² *Roberts* 71.



matters are left to the users of the water. The headworks of the canal, the main line and branches, the distributaries and minor distributaries, are all constructed and maintained by Government, but the field channels or watercourses by means of which the water is finally conveyed on to the fields, are usually constructed and invariably maintained by the cultivators themselves. Water is emitted from the Government Canals through outlets built in their banks, and it is in general at these outlets that the responsibility of Government ends and that of the cultivator begins.¹

There has, however, lately been a tendency on the newer canals for Government to construct the watercourses on behalf of the cultivators. The efficiency of a watercourse depends primarily upon its correct alignment and to secure this requires technical skill. Even the cultivator, who is accustomed to irrigation, cannot be expected to select as good a line as an engineer equipped with instruments of precision. Where Government constructs a watercourse, it remains the property of the irrigators, the cost being usually recovered from them in easy instalments, often by the imposition for a term of years of a small acreage rate on the irrigation thus effected.² The responsibility for the distribution of water is similarly shared between Government and the irrigators, the former distributing the water as far as the outlets, and the latter doing the final distribution from the watercourses to the various fields. In cases in which a watercourse is shared between two or more cultivators, and they are unable to agree as to an equitable distribution of the water between them, a right of appeal lies to the Irrigation Officer, who can then step in and enforce suitable arrangements for the sharing of the supply.³

The area irrigated by an outlet is called an "Irrigation *chak*." Experience has proved it to be wasteful and ineffective to attempt to irrigate every square in the *chak* simultaneously. The up-to-date method which has proved effective is to turn

¹ P.A.R. 392. Usually a separate outlet is given for an area of from 20 to 30 squares.

² P.A.R. 393.

³ P.A.R. 394.

the full discharge of the watercourse on to each square in succession and then, within each square, on each acre in succession. The question of the size of the *chak* thus becomes important, since it is expedient to provide for a watering for each holding during the period for which the distributary is running. In the summer when canals run continuously the problem is simple. In the winter, however, the supplies of water in the rivers are insufficient to keep the canals running continuously with full supply. The distributaries, accordingly, have to be closed on a system of rotational turns and the size of the *chak* should be such as to ensure a watering for each holding during the turn of full supply, which is usually ten days.¹ The day for the purposes of irrigation is divided into eight *pahras* of three hours each and it is the practice to allow each holding a turn² of from two to four *pahras*. With the outlet drawing its proper supply a turn of four *pahras* is enough for one square. It follows that in ten days there can be 20 four-*pahra* turns, and that the maximum area of a *chak* should be twenty squares or about 500 acres. In practice it has been found inconvenient to reduce the length of a turn to less than two *pahras*. Consequently, in theory, the minimum size of a holding should be half a square and the maximum number of half square holdings in a *chak* forty. Undoubtedly the 500 acre *chak* is the ideal to be aimed at. It is not, however, always obtained or always obtainable.³

To facilitate distribution and economise water, each *kill*a or acre is divided into a number of compartments.⁴ According to Canal regulations this number is supposed to be eight. As one cusec will irrigate an acre in one *pahra*⁵ each compartment takes $22\frac{1}{2}$ minutes. With a supply of two cusecs the time is halved and it is in that case difficult to control the water if eight compartments are maintained. The cultivator usually arranges matters so that he has 20 minutes to half an hour for each compartment. This figure

¹ C.M. 400.

² *wari*.

³ C. M. 410.

⁴ *kiari*.

⁵ one cusec gives 3 inches of water over an acre in 3 hours.



of eight compartments per *killa* is, therefore, only suitable for supplies below $1\frac{1}{2}$ cusecs; "above that a smaller number should suffice. It must be remembered that the cutting of the bank of the watercourse in eight different places to irrigate an acre entails much labour and tends to weaken the banks and cause leakings, especially when the supply is considerable."¹

These leakings often break through and flood large areas, turning roads into a marsh and waterlogging the countryside; and this, too, at a time when the cultivators at the tail² of the canal are crying out for water. Large compartments, on the other hand, are difficult to keep strictly level, while one side is flooded, the other may be quite dry, and thus an unnecessary large amount of water may be required to water the whole compartment properly. Well owners, who have to economise water, reduce their compartments to the minimum. But they are less handicapped by the necessity for constructing long leaky watercourses. The ideal size of a compartment in a particular case should, therefore, be found by balancing these conflicting considerations in view of the local circumstances.

The question is most important; but little attention is paid to it, and water is recklessly squandered through breached watercourses and large compartments. To check this waste would require a closer supervision than is possible under existing conditions. The problem could be easier tackled at the other end. If canal water were sold by volume instead of by the area irrigated, the cultivator would himself suffer from waste, and would easily enough devise steps to prevent it.

As things are, however, water-rate is charged on all land growing an irrigated crop. It lies with the amalgamation scheme. the canal village accountant to determine for each harvest what land is liable for water-rate, (and also, in cases where the land revenue is fluctuating, for land revenue too). This he does by a series of crop inspections which are, in theory, much more elaborate than those conducted by the revenue village accountants,³ though in

¹ Roberts 72.

² p. 297.

³ p. 184.

practice, they are far less accurate. For the revenue accountants also do crop inspections of the same areas. But the revenue crop inspections only serve to provide material for agricultural statistics, while the canal crop inspections determine the water-rates (and often the land revenue) to be paid by the cultivator. The two often differ,¹ but while the canal entries are more important, as determining taxation, the revenue accountants' entries are more accurate. He has no inducement to be dishonest, while the canal accountant is often bribed to enter a crop as worthless, when it is not, or again to enter land as irrigated when it has received no water.

This duplication of work not only results in Government paying twice over for two sets of officials each doing the same work, but it also imposes an equal, if not greater, burden on the peasantry, who have to gorge the maws of two hungry pikes, where one would suffice. Of the two, the canal accountant is the most oppressive. He has the most power, as it is he that can decide whether or not a particular cultivator is to pay water-rate and land revenue; and though the assessment is normally only imposed on those who actually get canal water, it is quite easy to enter as having received it fields which have remained perfectly dry,² should their cultivator fail to subscribe towards the maintenance of the irrigation staff. A share of the subscriptions received by the canal village accountants is passed on to the *zilladars* and sub-divisional officers, whose supervision over the accountant's work is consequently perfunctory in the extreme. The cultivator's remedy against oppression by the canal accountant lies in his appeal to the sub-divisional officer.

But his appeal, if preferred, serves only to annoy the accountant against him, its chance of success being practically *nil*, the crop being generally harvested long before the appeal is taken up by an already biased sub-divisional officer.

¹ I found this out myself by comparing them.

² I verified this as a fact in the case of some villages near Bhiwani (in the Hissar district) when I was making enquiries into the working of the canal revenue system, with a view to the introduction of the Amalgamation scheme.

The lightening of this double burden was one of the most rational objectives aimed at by the more public spirited members of the first Reforms Council. But the Reforms Government was more concerned to pander to political pressure, than to redress real grievances (a far more difficult undertaking). Ultimately, however, it yielded and agreed to making, on one canal, the experiment of transferring to the Revenue Department, the whole of the work connected with the collection of canal water-rate leaving to the Irrigation Engineers only technical irrigation problems. That the experiment was intended to be a failure was manifest to all when it was known that the Western Jumna Canal had been selected as the theatre of the experiment. Not only did the assessment of the areas irrigated by this canal lack the simplicity consequent on the introduction of *killabandi*, but the method of assessment itself was also intrinsically more complicated. Moreover, the existing system was seen at its best there, in the south-east of the Punjab, where the village communities still retained something of the ancient cohesion and political¹ prescience, which enabled them of old to come to terms with Moghul officials and in later days to come to a reasonable arrangement with canal subordinates.²

But the scheme might still have been a success had Government cared to make it so. The canal officials of the tract carried out the orders of amalgamation loyally, though without enthusiasm, and the responsibility for the failure of the scheme must rest entirely with the Revenue Department, headed by the Financial Commissioner. A Committee³ was appointed to arrange the details of the Amalgamation

¹ I use "political" here in Aristotle's sense and not in the sense attached to it in the slang of stump orators and modern Government officials.

² I do not know of any Indians more delightful to deal with than the peasantry of the south-east Punjab. Certainly I was never happier than when working amongst them (1913-19). They have all the horse sense characteristic of the ancient Roman and the modern Englishman, the willingness to be reasonable, combined with a refusal to be done down. They treat their women reasonably, and a visit to a Jat village in the Rohtak district might have toned down the invectives of Miss Mayo.

³ of which I was the Secretary.

Scheme (as it was called) and from the first the canal officials were unnecessarily exasperated by the offensive *hauteur* with which the Financial Commissioner rejected such of the Committee's proposals as were intended to make things easier for the affected members of the Canal staff. The attitude of the Financial Commissioner was reflected in his subordinates, and the *tahsildars'* derisive vauntings resembled the unseemly exultations of Achilles over the body of Hector. Their exultations were, however, somewhat premature. The Canal Department were by this time thoroughly annoyed. The distribution of water is a difficult business, at best, even when the indenting staff at the tail,¹ and the supplying staff at the head are in complete harmony. But the Canal Department was now no longer concerned to exert itself about indents received through contumelious *tahsildars*, who now helplessly witnessed the swamping of certain tracts and the withering of others. Even then the situation might have been saved by a little tactful adjustment, but when certain proposals to that end made by the Commissioner² were all rejected by the Financial Commissioner, the failure of the scheme was only a matter of time. Even the *tahsildars* wearied of extra duties which brought them neither power nor pelf but only botheration; and finally the peasantry themselves tired of a scheme apparently framed only to deprive them of water.

The scheme received its final quietus in 1927. This can, however, hardly be the last word on the subject. In the Canal Colonies of the Central Punjab the existing system remains expensive to the Government and burdensome to the people; while it is unpopular even with the Canal Revenue Staff of Deputy Collectors, *zilladars* and village accountants who are deprived of those prospects of promotion which would be open to them under amalgamation.

¹. The end of a canal distributary, where it is always difficult to get enough water.

². These were made after consultation with the Canal Superintending Engineer and myself as Director of Land Records, and had our whole-hearted approval. Had they been adopted they would have done much to make the scheme workable.



Its main buttress still remains, the Canal Sub-divisional Officer, who under amalgamation would have no subordinates from whom to receive supplies.

An impartial observer of this absurd fiasco is inclined to ejaculate "A plague on both your houses." Volumetric sale of water. Cannot some more satisfactory system of taxation be found for the wealthiest portions of the Province than through the agency of a horde of underlings who have no inducement whatever to believe that 'honesty is the best policy'? The reply (to use the official jargon) is in the affirmative. If taxation were levied in the form of a charge proportionate to the volume of water supplied, instead of to the area stated by the Canal village accountants to have been irrigated, the problem would be at once simplified. This would not be difficult now that outlets are fitted with a meter¹ accurately measuring the discharge of each distributary. The payment by volume would, moreover, give the cultivator every inducement to make his water go as far as possible, and to use it in the way he found most profitable. Unfortunately, however, this proposal runs entirely counter to the vested interests of the subordinate canal staff, and is therefore steadily opposed by the Irrigation Department as a whole.² Whatever his faults, a canal village accountant feels that he has the whole force of the Irrigation Department behind him; and it is this feeling that renders the Canal underlings so much more oppressive than those of the Revenue Department. Sir Michael O'Dwyer was a Lieutenant-Governor to whom corruption was as hateful as sedition. But even in those days of a Governor who governed, he found that "a misplaced confidence in their subordinates or an undue *esprit-de-corps* led" the "Irrigation Department to obstruct, though not with success, his efforts to bring influential bribe-takers to justice,"³ one official of some standing in the Irrigation Department being convicted and sentenced to three years' imprisonment.⁴

¹ Roberts 73-4; A.C.M. 62-3.

² A.C.M. 64-5.

³ O'Dwyer 67.

⁴ O'Dwyer 47.



6.—WATERLOGGING.

It is a noteworthy fact that the excessive development of alkalis in India, as well as in Egypt and California, is the result of irrigation practices, modern in their origin and modes, and instituted by people lacking in the traditions of the ancient irrigators, who had worked these same lands thousands of years before. The alkali lands of to-day, in their intense form, are of modern origin, due to practices which are evidently inadmissible, and which, in all probability, were known to be so by the people whom our modern civilization has supplanted.

KING¹.

The search for "the most effective method of using irrigation water has been greatly neglected in India. Under present conditions, canal water is assessed according to the area irrigated and according to the crop grown. This leads to the waste of valuable water and, what is far more serious, to the gradual destruction of the natural fertility of the land, the rate of deterioration depending on the amount of over—watering and on the absence of rest from surface flooding. Some system, in which the cultivator can be encouraged to use as little water as possible, and also to give the land a periodical irrigation fallow, is required. The great advantage of resting the land between two irrigated crops is well seen in Sind, where heavy crops of millets, which require large quantities of nitrogen, follow one another every two or three years without any manure beyond the intervening period of fallow. If a periodical rest from surface flooding is not provided on fine alluvial soils, the fertility falls under intensive irrigation. Further, when desert lands first come under irrigation, it is well-known that fewer waterings are needed than are required in succeeding years. These results are a natural consequence of the loss of soil texture which follows surface flooding on many soils. The soil particles, many of which are lenticular in shape, arrange themselves parallel to the surface, and so

¹ In "Irrigation and Drainage" (London 1900).

reduce the total volume of the pore-space. This naturally diminishes percolation and reduces the air-supply of the soil. Rest from irrigation appears to have the reverse effect and to re-create the characteristic open texture of desert soils. The obvious remedy is to use less water and to allow, every now and then, this natural recuperative process to have full play. This, however, must remain a counsel of perfection as long as water is sold according to the area watered. No incentive to use less is provided, the temptation to use the maximum is always in operation. Taking the long view, the trouble saved in ease of assessment is very dearly purchased by the deterioration of the land. Sale by volume is the obvious remedy."¹

A faint idea of checking waterlogging must have been present in the minds of those who for each The "per-missible" canal project designed a "permissible" ² percentage of the gross commanded and culturable area which might be irrigated each year.³ Most of the canals in the Punjab were designed for 66 per cent. permissible; in the Lower Chenab the percentage was raised to 75 per cent. The actual irrigation done is generally 100 per cent; and the cultivator is very dissatisfied if he cannot reach that figure, which, after all, means only one crop per annum on the whole of this area. Even in the Lower Bari Doab Canal which was designed for 66 per cent "permissible" the irrigation is approximately cent. per cent. The fixing of a law permissible not only protects Government against failure to fulfil expectations, but has in the past undoubtedly acted as an incentive to economy of water through the desire of the cultivator to grow at least one crop per acre per annum. This result has, however, not been obtained merely by economy, for supplies are liberal during the early years of a new canal, and the percentage of cultivation is approximately 100 from the start, though later this percentage is maintained on a smaller supply of water.⁴

¹ *Indian Agriculture* 51-2.

² *haqq abpashi*, i.e., right of irrigation, but Government deprecates the use of the term *haqq-right*, fearing civil suits against itself.

³ *C.M.* 395.

⁴ *Robert's* 78.

Canal Engineers are heavily handicapped by the artificial nature of the water-rate which has to be accepted for all projects, Rs. 5 per acre which is roughly what the Canal Department is allowed to charge for the supply of water, is excessively low. Land which before was worth nothing thus becomes worth from Rs. 400 to Rs. 500 an acre as soon as a canal has been made.¹ Were the Canal Engineers allowed to charge the market price for water as a commodity it would have been possible to have designed canals large enough to have taken some of the surplus summer flow of the rivers. This would have greatly extended the area of irrigation in the summer and prevented the artificial premium on winter irrigation which now exists when canals are only large enough to carry the minimum winter discharge. Under the artificial conditions now in force the canals are inevitably designed not to give the maximum wealth to the province, but to bring in profit to the Department under those conditions. For a "canal to pay its way and to bring in the greatest revenue, the water has to be distributed so that the most expensive crops like cotton and sugarcane can be grown. This involves fairly frequent waterings so that there is no cessation of growth between sowing and harvest." Hence the institution of perennial irrigation and the concentration of the cultivated area commanded so that the maximum area may be irrigated and the maximum revenue obtained.

But crops under irrigation do not continue to flourish in the way that they would under normal rainfall. Ripening is frequently delayed and the quality of the produce is apt to be irregular and inferior. Moreover "the standard of cultivation under a canal tends to deteriorate. After a few years, the producing power of the soil falls off; patches of alkali land often appear and grow in size and there is a tendency for the villages to become malarious." Compared with the best well-irrigated regions or with localities where the crops are watered by rainfall alone, "the well-being

¹ See Appendix XIX.

of both plants and animals on the perennial canal leaves a good deal to be desired. Canal irrigation in the hands of the cultivator seems to put a brake on the wheel of life." The fact is "that rainfall and canal irrigation are different things from the point of view of the plant. Doubtless rainfall and canal irrigation have one factor in common, namely the provision of water. In almost every other respect, however, they are quite different. Rain is a saturated solution of oxygen in water, and usually reaches the soil so slowly and at such long intervals that it does not destroy texture to anything like the same extent that canal water does. Moreover, it supplies the soil with oxygen in a highly effective form. Canal water is much poorer in oxygen, it destroys the tilth, and the total period of its application to any particular crop is only a matter of an hour or two. Further when the surplus irrigation water cannot flow away under ground there is a gradual rise of the sub-soil water-level which may reach almost to the surface. Small as these differences at first sight appear, nevertheless they are sufficiently important in the course of a few years to bring about a marked fall in the fertility of the soil."¹

Though at present the evil is limited, the danger for Government the future is considerable, as is seen from the enquiries. The fact that the water-table is rapidly rising in canal-irrigated areas, and though this is an advantage at first as it makes well irrigation easier, yet it implies possibilities of danger from water-logging if it continues. It was by the restriction of the area of the permissible that the first attempt was made to check the rise of the water-table.² The problem first reached an acute stage on the upper reaches.

¹ A.J.I. (May 1926) 175.

² As a tentative measure the following scale was approved for the percentage of the gross area commanded to be irrigated annually:—

Depth of the spring water level below ground.	Percentage of gross area of village which may be irrigated.
40 feet or more	50 per cent.
25 to 40 feet	40 per cent.
Less than 25 per cent.	25 per cent. or Kharif irrigation only.



of the ill-fated Upper Chenab Canal, which, raised up by embankments above the level of the surrounding country, and so aligned as to obstruct all the natural drainages, rapidly transformed the clay soils through which it flowed into a morass. The people suffered for sometime before Government would recognize the seriousness of the problem, the Canal Department hotly denying a liability which might render them liable to pay compensation. At last, however, the wails of the people of Sambrial, a town which had been transformed to a less picturesque and less sanitary Venice, with streams for streets but no sea for commerce, began to take a political turn; and the Government which had been indifferent before, now fully awoke to their grievances.

Sir Michael O'Dwyer had already in 1918 constituted a Drainage Board to deal with the problem. Waterlogging was not due to canal irrigation exclusively. It was in places caused by imperfect natural drainage, or the obstruction of natural drainages by roads, railways, irrigation channels and cultivators' embankments.¹ The growing seriousness of the problem led to a more scientific study of the history of the water-table in canal irrigated tracts. The method followed in effect gives an expression for the sensitivity of the water-table in terms of the water supplied to the soil as irrigation or as rain. The computations involved in applying such methods to whole canal systems are very laborious but as a result it is hoped to obtain accurate information on the relative importance to the rise of the water-table of such factors as (1) the irrigation of fields (2) seepage from canals or their distributaries and (3) rainfall. The above are all local influences; in addition information is required on the direction and magnitude of the sub-soil streams.²

The first and most obvious remedy for waterlogging Remedies for lay in the maintenance and improvement of waterlogging. the natural drainages of the affected areas. Drains are certainly required for the rapid removal of surface water due to rain or other causes, and it is important

¹ P.A.R. 204.

² A.C.M. 70.

to see that railways, roads and canals do not obstruct the natural drainage of the tracts through which they pass. As a means of lowering the water-table, however, drains are both expensive and doubtfully effective. "Free water in the soil moves by gravity, and hence its natural direction is downwards. In a field with drains at a depth of (say) 3 feet and a water-table at 4 feet depth no drainage would occur. If water is added on the surface, the water-table rises until it is at the height of the drains, when water will flow into the latter and drainage begins. If the drains are 40 feet apart, the water-table in between the drains will be $1\frac{1}{2}$ foot to 2 feet only from the surface, when the drains practically stop running. If the drains are in working order, crops will thrive under the above conditions, provided the water-table does not remain long so near the surface. If the cause of the high water-table is percolation from the canal it is likely to be permanent, and each irrigation given would cause temporary waterloggings. The deeper the drains the more useful they will be, but they are at best a very partial cure.

Ultimately all the evils of the present system of irrigation can be traced to the low water-rates which prevent the Irrigation Department from considering any problems but those of immediate profit. The problem of waterlogging would be greatly simplified by waterproof lining of the canals,¹ a perfectly feasible proposition if water were sold as a commodity. Volumetric sale would also lead to economy of water, a still further check on waterlogging. Cultivators would then divide up their land into small irrigation compartments,² and distribute water through their fields through pipes,³ conserve moisture by the liberal use of manure, in fact seek in every way that economy of water which so characterises the cultivation of land irrigated by wells, and is in canal-irrigated land so conspicuous by its absence. The same problem arises in connection with another cure for waterlogging, the installation of tube-wells.⁴

¹ Roberts 75-6.

² kiari—(Brayne 5).

³ Brayne 9.

⁴ A.C.M. 73-4, 88-9.



These can easily be made to pay if water is sold at its commodity value, but not if the ordinary water rates are charged. The sale of water as a commodity would have not only solved the problem of waterlogging, but provided Government with a fund, from which it could have equipped the Canal Colonies with roads, railways, hospitals, schools, electric light, in fact all those modern conveniences which are now so lacking, and for which the growth of education is rapidly increasing the demand. The substitution for such a volumetric sale of low water-rates has given the canal colonies a plutocracy of *nouveaux riches*, who spend their unearned increment in bribing Government servants to grant them privileges to which they are not entitled. Here, as elsewhere, the best remedy for corruption lies in a sound system of administration, rather than in encouraging sneaking by Paul Prys and Peeping Toms.



CHAPTER IV.

THE GIFTS OF NATURE.

1.—AGRICULTURE.

Quid faciat lætas segetes, quo sidere terram
Vertere, Maecenas, ulmisque adjungere vites
Conveniat, quæ cura boum qui cultus habendo
Sit pecori, apibus quanta experientia parcis
Hinc canere incipiam.

VIRGIL : *Georgics* i. 1¹

“ The outstanding feature of Indian agriculture is the importance of the plant. The country is a land of small-holders chiefly occupied in the raising of crops. Not only the population but also the trade of the country depend on the produce of these millions of small fields. To increase the well-being of India, therefore, crop production must be stimulated and each unit must be made to yield either more produce, more valuable produce or an increased yield of a better quality than the average. To accomplish this two things are necessary—a knowledge of plants and how they work, and the discovery of practical methods of speeding up growth.

The essential nature of a crop can be stated in a few words. It is a group of living factories which makes use of two classes of raw material; one obtained from the soil, the other from the atmosphere. Various mineral salts, in dilute solution in water, enter the plant from the soil by way of the root-system and are carried to the green leaves by the upward transpiration current. From the atmosphere, oxygen and carbon dioxide reach the same point by way of the pores of the leaf. In the green cells, these classes of raw materials are worked up

¹ What makes a plenteous harvest, when to turn
The fruitful soil, and when to sow the corn ;
The care of sheep, of oxen, and of kine ;
And how to raise on elms the teeming vine ;
The birth and genius of the frugal bee
I sing.

Dryden's translation.



into complex food substances by means of energy focussed from the sun through the medium of the chlorophyll¹ corpuscles. Unlike an animal, a plant has to make its own food before it can feed. In both cases the actual food, however, is very similar. The crop has to manufacture food, to develop new organs, and to complete its life cycle under constantly varying conditions as regards the supply of raw materials, temperature illumination and humidity. The manufacture of its own food by the green leaves is the first work of the plant. Its second duty is to provide a surplus—in the shape of reserve materials which are often packed into the seed for the use of the next generation. Man intercepts these reserve materials for his own use, and on their amount and quality the success or failure of crop-production depends. In this manufacture of food it is well to bear in mind the fact that the plant has always to feed itself first of all, and that the formation of reserves marks as it were a second stage of activity. Naturally the higher the efficiency of the factory the more food there will be for growth, and the greater will be the volume of the reserves. The duty of the investigator of crop problems is to study the working and out-put of this natural factory, to discover the directions in which it can be improved and then to devise the most practical methods of carrying this out in the field.”²

Nature has given the Punjab plains every agricultural gift except water,—a rich alluvial soil of sandy loam interspersed with patches of clay and tracts of pure sand easily ploughed and requiring little artificial drainage, and a temperature eminently suited to the working of those organisms which are so essential for the preservation of the soil in a condition of healthy fertility. Moreover, the dry climate allows less washing of nitrates and other chemical constituents beyond the reach of the roots of crops, while it facilitates at the weathering

¹ the green colouring matter in the plant.

² *Indian Agriculture* 10-11.



processes favourable to a good tilth.¹ The soils of the Himalayan and lower ranges resemble those of the plains, but both sand and clay are rarer, and the stony area is considerable.²

The three chief needs of the soil are water, oxygen and organic matter. The necessity for the first is apparent to all. But the necessity for oxygen is not so apparent. "This is required for the soil organisms and the roots of the growing crop and is a factor of paramount importance in a country where the growth period is short and where the soils are often finely divided. If the air-supply of the soil is in defect, serious trouble ensues. The preparation of food materials for the plant becomes impossible, and the crop is unable to develop an adequate root system. Valuable time is lost, and the yield suffers, although everything else—potential soil fertility, ample soil moisture and a suitable variety may all be present together. An inadequate supply of oxygen in the soil puts a brake on the wheel of life.

In many of the alluvial soils of north-west India, including Sind, the shortage of oxygen in the soil becomes so great that a condition of extreme oxygen hunger is set up. A change in the soil flora takes place; a group of soil organisms, which are able to extract the oxygen they need from various salts in the soil, is established. The new soil population sets up a condition of intense reduction, which eventually leads to the development of the alkali condition, a phase which marks the death of the soil as far as crop-production is concerned. The amount of soluble sodium salts in land in this condition renders the soil solution too concentrated for the growth of crops. The roots cannot absorb moisture and the crop withers. This alkali condition is very common in parts of the United Provinces, the Punjab and Sind, and is everywhere associated with soils through which water can only pass with great slowness or not at all. When water cannot pass readily through a soil, adequate aeration is out of the question, and the subsequent development of the

¹ *A.C.M.* 150.

² *Gazetteer* 57; *A.C.M.* 150.

alkali condition is only a question of time. This danger is greatest when close, stiff, alluvial soils are brought under perennial irrigation. The constant flooding of the surface causes the soil particles to settle into a condition of close packing and to produce gummy substances known as colloids. The supply of air then becomes restricted and there is a rapid fall in productivity. The alkali condition follows. The soil dies and the land goes out of cultivation."¹

An even more serious defect in the soil of the Punjab is the low content of organic matter. "Given Manures, a supply of this material in a suitable condition for rapid nitrification, the response both in the rate of growth and in the total yield is marvellous. The highly manured lands round the villages yield crops luxuriant in comparison with those of the outlying unmanured fields. The whole countryside is a gigantic manurial experiment, and the certain results which follow the addition of organic matter to the soil need no investigation."² Manure is particularly necessary for exhausting crops such as sugarcane, maize and potatoes, which require a relatively large amount of plant food for their growth,³ and the manure available is generally reserved for such crops, wheat, cotton, barley and melons being only occasionally manured. Spiked millet,⁴ gram, and other inferior crops are never manured. Thorough manuring costs from Rs. 60 to Rs. 80 an acre, and is most common in the vicinity of the larger towns, the municipalities of which make a considerable income by the sale of refuse. In such localities from two to four very rich crops a year are grown. Irrigated land is manured much more generally than unirrigated. Besides the sweepings of villages, night-soil, the dung of sheep, goats, and camels, nitrous earth and the ashes of the burnt cow-dung are all used for manure.

It is universally recognized that no artificial manure has succeeded in keeping up the fertility of the soil so well

¹ *Indian Agriculture* 17-18.

² *Indian Agriculture* 16-17.

³ *Agricultural Practice* 175.

⁴ *bajra*.



as farmyard manure. This is mainly because artificial manures supply the end products to the plant instead of liberating them gradually by natural decomposition. Farmyard manure and also the plant residues (which are essentially the same thing) decompose in the soil, giving rise to many substances of different types. But there are also certain intermediate products, and it is quite possible that some of these may have special effect on the growing plant, somewhat comparable with that of the vitamins of plant physiologists. ¹ The value of farmyard manure has been more fully appreciated in Europe. For centuries past the farmers of England were bound by the terms of their leases to return to the fields all the straw and dung of their farms and were not allowed to sell it outside. ²

But the conservation of farmyard manure is only possible when a substitute has been found for the fuel provided by the universally used cow-dung cakes. The peasant complains of shortage of manure, but burns his cow-dung and lets the white-ants eat his firewood supplies. Timber should be grown for fuel on all spare land; suitable grates for burning wood should be devised, and people should be taught how to boil milk over wood and other fuel so that all the cow-dung may be religiously reserved for manure. "One very good way would be to erect temporary sheds in empty fields and keep the cattle in them all the year round, moving the sheds round from field to field. Propaganda has gone so far in Gurgaon that village and individuals are already beginning to stop making dung cakes. If Government offered a little land revenue remission for tree growing and started a vigorous campaign against dung-cakes it could kill this pernicious custom in five years. The village sweepings are thrown in a heap to be blown away by the wind, washed away by the rain and desiccated by the sun. Double value would be got by pitting and the health of the village would improve enormously." ² Village sanitation and manure conservation are complementary. "Everyone with separate cultivation should have his manure

¹ *A.J.I.* (March 1926) 123. ¹ *Calvert* 208. ² *Brayne* 61.



pit six feet deep and ten or twelve feet wide and as long as he requires. Into that pit everything should go. "It must be far enough away for the smell not to reach the village and near enough for the people to carry everything to it and not be tempted to throw it down on the way". They should use their pits as latrines and cut all the rank weeds and rubbish that grow round the village in the rains and throw them in too. They are not so much pits as the cultivators treasure-house; and once he has seen the crops the new manure produces he will never allow rubbish to go any where else but into his own pit.¹

Failing farmyard manure the necessary organic matter may also be supplied to the soil by green-manuring, which has the additional advantage of adding nitrogen to the soil. "The growing and ploughing-in of a crop to serve as manure for the succeeding crop has been practised on a small scale from ancient times in India. The crops generally used are leguminous, and *san-hemp*² has generally been the favourite. Of recent years *guara*³ has been found to give much better results at Lyallpur. But green manuring can only be recommended where the summer water-supply, whether from rain or canals, is plentiful."⁴

But good soil, well watered, well aired and well manured is only the better suited for the growth of weeds, which may be defined as plants out of their proper place. Their survival value is greater than that of crops in as much as a weed has only to survive and propagate itself, whereas a crop has to survive, propagate itself and in addition bring forth extra seed for the use of man. Unless therefore man restores the balance by perpetually cleaning the soil of weeds they will spread and choke the good seed. This the laziness of Punjab cultivators often enables them to do. The annual loss due to the occurrence of pernicious weeds upon farm lands, is far greater than is generally realized. The figures would be alarming if these

¹ *Brayne* 11-12.

² *Crotalaria juncea*.

³ *Cyamopsis psoraliorides*.

⁴ *Roberts* 29.



losses were estimated on a cash basis. "Weeds not only reduce the yield of crops by robbing plant food and moisture, but certain weeds get such a hold on some soils that cultivation becomes impossible on them. These losses can be considerably lessened by treatment based on an accurate knowledge of the nature of each weed." ¹

Weeds² may be classified according to the length of time they live as annual, biennial or perennial, or according to the season in which they grow as summer or winter weeds. The classification of weeds facilitates their eradication, "for in the case of annual and biennial weeds the treatment is usually to prevent them from seeding, while in the case of perennial weeds the formation of new leaves and roots and underground stems is to be stopped. It is essential to know the habit of growth as well as time of germination and ripening." Weeds should never be allowed to ripen seeds. "One year seeding seven years weeding." "All weeds bearing mature seeds should be burnt or thrown in places from which they cannot be carried easily to fields by wind, water or animals. Sometimes such weeds are fed to cattle and the refuse is taken to the manure heaps, whence their seeds find their way to the fields. A manure containing such weed seeds should never be applied fresh. Efforts for eradication of perennial weeds should be persistently made. Imperfect treatment such as a single ploughing may do harm instead of good by breaking under-ground stems and stimulating their growth. Finally a cultivator should always use clean seed and should always be on the alert to prevent new weeds from becoming established." ³

A particularly pernicious weed is the wild *baru* ⁴ grass, not only in itself but as the habitat of those insect pests. Insect Pests. insect pests the sugarcane, maize and millet stem borers. Removal of the stubble after harvest seems the most effective and practical method of checking the

¹. Roberts 86.

². A list of important Punjab weeds is given in Appendix XX.

³. Roberts 87.

⁴. *Sorghum halepense*.

ravages of these pests. Still more important to the commercial world is the discovery of methods of dealing with cotton pests. The use of parasites in affected fields seems the best method of control of the spotted boll-worm, while for cotton stem-borers the removal of sticks from the fields as soon as possible after the cotton crop is picked is recommended: the 'kuttra' caterpillar,¹ which does extensive damage by eating up the young plants of summer crops, has been very successfully dealt with by means of light traps. The most promising method of preserving stored grains from insect attack is by super-heating the granaries² in which they stored.

These are the methods of modern science.³ More primitive and of long standing are the methods for dealing with the plague of locusts which every year visits one neighbourhood or other. As a rule locusts speedily disappear after doing an amount of damage which is in the aggregate small, though very serious to the farmers whose fields have been attacked. In some seasons, however, vast swarms invade the Province and commit widespread devastation. Their power of multiplication is enormous. To deal with them the whole machinery of the land revenue organisation is mobilized. For the work of destruction the *tahsildar* and his assistant should be held responsible for seeing that *zaildars*, headmen and the villagers working under them do their duty. When eggs are hatched, the young unfledged locusts should be attacked and followed up till destroyed, not merely by the men of the estate in which they first appear, but by gangs collected from the surrounding villages and working together. Arrangements should be made for relieving persons who have worked their fair turn and replacing them by others.⁴

Far more pervasive and generally destructive is the rat.

Rats. The rat has followed man to every part of the world and is present to-day in every country. The damage that it does to mankind is enormous and it is

¹ *Amsacta Sp.*
² A.C.M. 151.

³ godown (godam).
⁴ L.A.M. 820.



known to be the worst enemy of the human race. The most destructive type in the Punjab is the field rat, ¹ a stout reddish brown animal with a whitish belly, and a very long tail tipped with a pencil of long, black hair. It inhabits both cultivated and uncultivated areas and makes extensive burrows with many inlets, coming out of its burrow only at night and being rarely seen during daylight. It feeds on the life blood of the agriculturist, the roots and stems of plants, wheat-ears and cotton-bolls, fruit and newly planted seed. It is present all over the Punjab, but is most common in Sialkot, Gurdaspur, Montgomery, Ambala and Karnal. The mole rat ² commonly known as the 'blind rat' in the Punjab, comes next in importance. It is a robust animal with stout and broad head, and a comparatively short, scaly, ringed, almost naked tail. It is found in cultivated and waste lands and its burrows run just under the surface of the soil, with a mound of earth at each entrance. It grunts when disturbed, and it is a good swimmer and can escape when fields are flooded.

(All rats increase at an alarmingly rapid rate, maturity is reached in about 2 months' time, one litter might consist of 4 to 10 young ones, but as many as 23 have been recorded. There are 3 to 6 litters in a year and the gestation period is only 21 days. Thus a pair breeding uninterruptedly and without deaths will produce in $1\frac{1}{2}$ years a progeny of 20 million rats. / Man as an agriculturist has destroyed many of the rats' enemies, giving it a much freer scope to multiply than nature intended. The waging of war against rats is a long and tedious business. The method of trapping, so beloved of the old-fashioned plague-staff, is not very effective against a father and mother and a $1\frac{1}{2}$ year old family of 20 million. Poisoning and the cyano gas pump are useful weapons; but prevention is better than cure, and the rat must be cut off from the ample food supply it gets in the grain stored in the houses of villagers. Rat proof granaries should be obligatory and sold cheap by Government, while every protection

¹ *Nesocia hardwicki*.

² *Gerbillus indicus*.



should be given to the natural enemies of rats,—cats, dogs, mongeese, owls, hawks and kites.¹

The agricultural advantages possessed by the soil of the Punjab as compared with that of a country like England, in the temperate zone, all depend ultimately on the greater heat of the sun, to which also is due the fact that there are two harvests. The summer² crops are sown in the early monsoon rains in June or July, matured in the later monsoon rains in August and reaped from September to December. Cotton and sugarcane are peculiar. Cotton is often sown and sugarcane planted in March when there is generally some rain, cotton being picked in November and sugarcane cut in January and February. The winter³ crops are sown from the end of September to the end of December, whenever rain or canal waterings render this possible, matured in the winter rains which generally come after Christmas, and reaped in March and April.⁴

The primitive agricultural economy of India still obtains in the greater part of the Province, where agriculture is still in the subsistence stage, and the production of food for the family is the first care of the individual peasant. In such areas oilseeds, sugarcane, and cotton are grown to provide the lamp oil, sweetmeats and clothes of the villagers rather than for sale. This primitive economy prevails most completely in the remote hill districts, where communications are defective, and has almost disappeared in the large wheat and cotton tracts which characterise the Canal Colonies, and the more varied intensive cultivation which is to be found in the neighbourhood of Amritsar, Delhi and other large towns.

The practice of growing different crops in rotation on a piece of land has been practised in India (as in England) from time immemorial. The differences in rotations depend on difference in the water supply. The Punjab canals are

¹ *Brayne* 58-9; Department of Agriculture, Punjab Leaflet No. 30.

² *kharif* or *sawani*.

³ *rabi* or *hari*.

⁴ *Gazetteer* 58.



so constructed as to take from the rivers only the amount available in the winter, the immensely greater summer volume of the rivers hardly doubling the canal supply, and not, therefore, compensating for the increased evaporation in the summer. This puts an artificial premium on winter, (as against summer) cropping. Thus, in a square of 25 acres, 11 acres may be sown under wheat in the winter, followed by the oilseed *toria* (sown in September and reaped in January) on 3 acres, the *toria* itself being followed by cotton (which is grown on 5 acres). One acre is generally under sugarcane, and the rest under miscellaneous crops and fodders. No simple rotation is possible owing to the small area under summer crops. Even in unirrigated tracts the preference is for winter crops, as the summer crops require rain more frequently (and do not always get it) while the winter crops can be sown after the late monsoon rains, and matured in the rain which generally comes between December and February. Moreover, the winter crops wheat, barley and gram are more marketable than the millets grown in the summer, while cotton, the marketable summer crop, requires a longer season of rainy conditions than is provided by the monsoon. A very common rotation on unirrigated lands is to put in a winter crop followed by a summer crop and then let the land lie fallow for a year. Unless a good deal of manure is available this is the course to follow, even in the case of irrigated land. Some poor hard soils are only fit for crops of coarse rice, sown after the embanked fields have been filled in the monsoon by drainage from surrounding waste. Other lands are cropped only in the autumn, because the winter rainfall is very scanty. Flooded lands are often sown only for the spring harvest.¹

On well irrigated lands in the neighbourhood of towns, a more intensive cultivation of vegetables and fodder crops is accompanied by heavy manuring. Away from the towns the well irrigated submontane tracts grow fine crops of wheat in the winter, followed by a heavily manured fodder crop in

¹ Douie 144.

the summer. Sugarcane is also commonly grown. Maize and rice, both summer crops characterise the stream irrigated tracts in the hills, while winter crops prevail in the white sandy loam soil of the plateau north of the Salt Range, in which summer crops are easily burned up. In the south-west cultivation mainly depends on wells or inundation canals, or direct flooding from the rivers. Recently, however, it has been discovered that even in the sandy desert gram can often be grown profitably in places where the advent of the railway has enabled a larger harvest to be marketed at a reasonable price.

The advantages of frequent ploughing are thoroughly recognized, especially for wheat and sugarcane for which a fine seed-bed is essential. The plough used is an implement of simple construction, made of wood with an iron or iron-pointed share, and drawn by a single yoke of oxen. When the soil has been reduced to a fairly fine tilth, a clod crusher,¹ consisting of a heavy log of wood roughly squared, is used to supply the place of a light roller. It breaks up any remaining clods and also compacts and levels the surface.

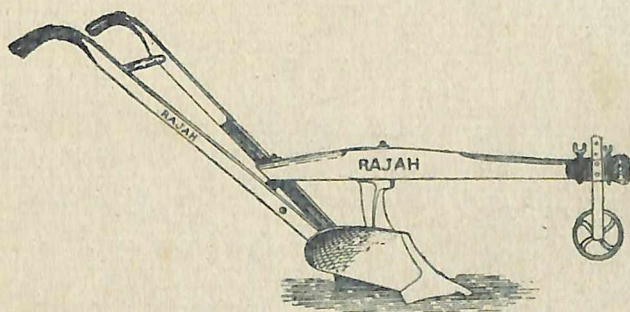
There are three indigenous methods of sowing; by scattering the seed broadcast on the surface, by dropping it into the furrows by hand, or by drilling through a tube attached to the plough handle. The last method, if skilfully used, deposits the seed in the bottom of the furrow, and is employed when the surface is dry. The second is employed in moderately moist and the first in thoroughly moist soils.² The Punjab cultivator aims at sowing every acre every harvest though he has neither the cattle to plough, nor the manure to strengthen the soil, nor the labour to weed it. A small area properly ploughed, manured when required and sown with good seed, gives far better results than are obtained by scattering indifferent seed over a larger area than can be properly managed.³

Weeding and hoeing are resorted to only for the more valuable crops. All crops are cut entirely by hand, and harvesting employs all the menials of a village, who get

¹ *sohaga*.

² *Gazetteer* 58.

³ *Brayne* 57.



The Rajah Plough.



well paid for their services, so essential is it to harvest the crop quickly and avoid the risks incidental to an uncovered threshing floor. Grain is mostly trodden out by cattle.¹ The implements in use have served the cultivator well in the past but are too primitive to meet the needs of modern agriculture. The iron sugar-press has now almost ousted the old cumbrous wooden type and is itself undergoing modifications at the hands of the experts of the Agricultural Department.²

The ordinary country plough³ is of immemorial antiquity. In primitive times the old bent tree bough drawn by oxen gradually developed into a plough with smoothed handles which cut up the soil with a tapering triangular spike of hard wood, the base of the triangle being uppermost. This spike was transfixed at right angles by a long pole to which the oxen were harnessed. This plough was excellent for the purposes for which a harrow is now commonly used, stirring the soils and breaking it up, but it was not very effective in cutting the top layer of soil, and did not entirely invert all the soil it loosened. It was originally made entirely of wood, but with the development of the art of hammering the soft and excellent iron which abounds in the Himalayas an iron cap was affixed to the point of the spike which dug the furrow. But transport difficulties rendered iron costly and its use for ploughs, as for hoes and other minor agricultural implements, was always economized as far as possible.⁴

Equally ancient is the wooden clod-crusher,⁵ whose primary function is to break clods, which it does most effectively when weighed down by labourers standing on it. It is, however, hardly less valuable as a leveller on irrigated land, which must be as horizontal as possible so to allow of even irrigation, for it definitely drags soil off the high parts of the land and leaves it on the lower parts. This also renders the

¹ cf. Deuteronomy xxv. 4.

² Gazetteer 59.

³ *desi hal*.

⁴ L.F.R. 73-4; Roberts 46-8. Dowie 143.

⁵ *Sohaya*.



clod-crusher a useful implement for covering seeds, even when these have been sown deep and the soil has not been subsequently harrowed.¹

“The great contrast between the shallow cultivation of the Orient and the deeper tillage in vogue in Europe has exercised a profound influence on many of the improvers of Indian agriculture. At first sight it seems so certain that the work done by the primitive Indian plough, which only pulverises the surface, must be inferior to that accomplished by an iron implement which works much deeper and also turns the soil upside down. Hence the persistent efforts which have been made to induce the cultivator to adopt iron ploughs in place of his old-fashioned wooden implement. The general introduction of the new method has been hampered by the limited strength of the work cattle who find soil inversion involves far too much work.”

Moreover, the use of a plough penetrating to eight inches on land that has hitherto been cultivated with a country plough penetrating to only four inches, at once dilutes the weathered soil with its own volume of subsoil. “The characteristic of subsoil is a lack of friability which works against the production of a good tilth.” The first effect, therefore, of using an inverting plough to its full depth of eight inches may be (especially in the case of heavy soils) to destroy tilth and with it fertility. “It may well happen in these circumstances that the immediate effect of the use of these ploughs will be a reduction of yield. Such a result is likely to prejudice their use, but such loss of yield will be temporary only, and each year will show an improvement. The danger can be obviated by applying discretion to the use of such ploughs in the commencement, gradually increasing the depth turned over each season until the maximum is attained”² and the weeds which are almost entirely ignored by the country plough are entirely uprooted or buried. Thus, though deep ploughing will improve the ultimate fertility of a field, such ploughing involves larger and more expensive ploughs,

¹ *Roberts* 53 *Douie* 143.

² *Agricultural Practice* 168.

³ *Indian Agriculture* 47.



stronger cattle, and if unintelligently performed, may easily lead to poorer yields in the first instance. " This means greater expense in the purchase of cattle and implements, greater cost in feeding the cattle, and, possibly, a diminished immediate return. It is useless recommending such a process to a cultivator who is only producing enough to supply his immediate wants from season to season. He cannot afford the extra expense and he cannot borrow the necessary money. Improvement in this case can only be effected by providing the means as well as the method; that is, by considering the economic, as well as the practical, aspect.¹

Expense is one of the chief obstacles to the use of the heavier furrow-turning ploughs of the type of the Raja, which are thorough in their work, and are essential if farmers are to get the best results in heavy clay lands or those which are badly infested with deep rooted weeds.² Much less complicated and about a quarter the price is the Meston plough, which, although an iron furrow-turning plough more nearly resembles the ordinary country plough. It is light and does good work on light soils; and is more tempting to the conservative rustic than the more uncompromising heavier Raja.

But iron ploughs leave the ground uneven and, therefore, require supplementing by some instrument of the nature of a harrow. Harrows, horse-hoes, and cultivators are implements consisting of a number of teeth affixed below some kind of frame intended for stirring the soil and breaking its surface." " They may primarily be divided into two classes. The heavier implements which work down to a considerable depth have fairly broad points, they will tear through considerable obstructions, and can thus be only used on fallow land or between the rows of a crop. Light harrows, on the other hand, have many fine points. Owing to their slight weights, they can be used on many crops (after they have been sown) without dislodging the seed or tearing up the plants.³ Of these the most important to the Punjab farmer

¹ *Agricultural Practice* 37-8.

² *A.C.M.* 175.

³ *Roberts* 50-1.

is the springtined harrow. After land has been watered by rain or by irrigation water, it remains in a fit state for working only for a few days, but if the surface of the soil is broken during that time, tillage operations may be extended over a much longer period. A pair of bullocks with a springtined harrow can break the surface of about four acres of land in a day, whereas a pair of bullocks with a country plough can only break one acre in the same time. Therefore the springtined harrow enables farmers to make far better use of any rainfall or irrigation water. This implement is of special importance in unirrigated tracts where it may enormously increase the area which a farmer can put under crop in years of scanty rainfall where the land is being prepared for sowing.”¹

“Drills for sowing seed in two or more rows at a time were until recently unknown in the Punjab, though they have been used for centuries in many parts of India. They have been introduced to the Punjab by the Agricultural Department and have been adopted by many farmers with very encouraging results.”²

The rapid diminution of ordinary pasture, as more and more land comes under cultivation, drives the peasant to rely more and more on wheat straw as fodder, and this has increased the importance of the mechanical fodder cutter, which not only economises time but also the straw as well. The introduction of modern implements and machines has been greatly hindered by the fact that an ordinary labourer on a farm does not understand them, and the local blacksmiths,³ for the same reason, is unable to effect adjustment and repairs. To remove these difficulties the Agricultural Department has for many years sent out mechanics to do simple repairs when required, while the staff on district work assists in putting things right when the trouble is slight. To further reduce this trouble a short course for village blacksmiths⁴ has been started in the Agricultural College at Lyallpur.⁵

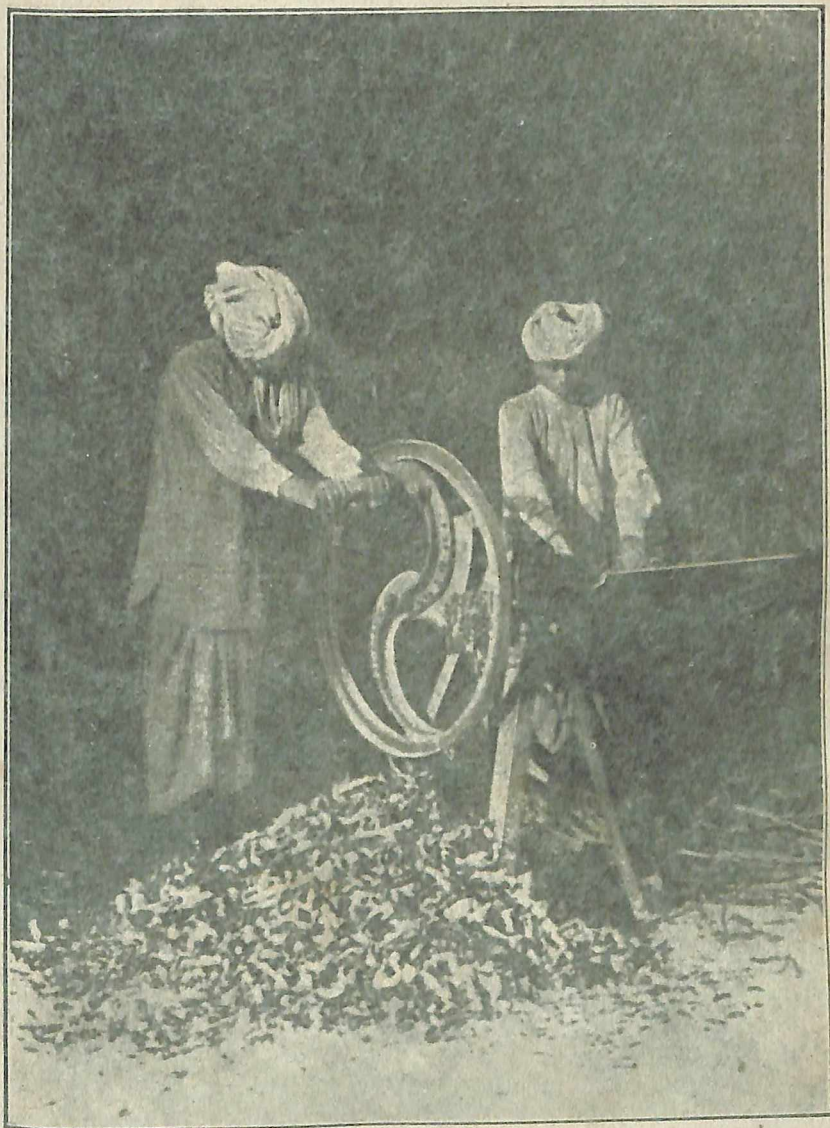
¹ *barani*.

² *A.C.M.* 175.

³ *Roberts* 54.

⁴ *Lohar*.

⁵ *A.C.M.* 75-6.



Fodder Cutter or Tokka.

2. CROPS.

The total area of the Punjab (including Native States) is 86 million acres, or rather more than that of Great

Main Agri- Britain and Ireland (77 million acres). Ex-
cultural Sta- cluding the Native States, the area is 60 mil-
tistics of the lion acres, or deducting 4 million acres of moun-
Punjab. tain tracts 56 million acres of land surveyed by the revenue
authorities, an area equal to that of Great Britain. Of
this area 30 million acres are cultivated (including fallows),
which is about the area of the arable land and pasture com-
bined of Great Britain. Deducting another $12\frac{1}{2}$ millions
acres of unculturable land, there remain $15\frac{1}{2}$ millions to which
cultivation can be extended, if adequate irrigation and com-
munications are provided. Grass land in Britain often
pays better than cultivation. Of the cultivated area ($14\frac{1}{2}$
million acres) in Great Britain wheat occupies 2 million
acres, barley $1\frac{1}{2}$ million, and oats over 3 million acres as
compared with 9 million acres wheat in the Punjab. In live-
stock the main difference relates to horses, of which there are
nearly 2 million in Great Britain as compared with 350,000
in the Punjab. There are 29 million sheep as compared with
 $4\frac{1}{2}$ million in the Punjab. It is roughly estimated that Rs. 30¹
per acre is sufficient capital for farming in the Punjab, whereas
£15 is required in Britain. Manures are largely used in
Britain for crops, and scarcely used at all in the Punjab,
partly on account of the greater expense, with the result that
the yield is considerably less, the yield of wheat averaging
about 10 maunds² per acre as compared with 24 maunds³
in England.⁴ The restricted supply of soil moisture and the
short period of growth make it difficult to cultivate high
yielding types. The concentration of the monsoon rainfall
into a period of between three and four months limits the
growth-period of the summer-crops and only rapidly maturing
varieties can be grown in the rains. Such varieties must, of
necessity, be low yields.⁵ But the cold weather crops

¹ say £2-10-0.

³ 32 bushels.

² 13 bushels

⁴ P.A.R., 480.

⁵ *Indian Agriculture*, 18.



have a longer season and much higher yields should be obtainable. The annexed table gives an accurate estimate of sown area and an approximate estimate of the outturn and value of the various crops irrigated and unirrigated in the year 1926-27. It should, however, be remembered that these official estimates of outturn are generally tainted with the pessimistic outlook of the Settlement Officer, who fears the wrath of Government if he under-assesses and the failure of his Settlement if he assesses too heavily. He, therefore, assesses fully on a deliberately under-estimated outturn.¹

¹ Punjab Season and Crop Report 1926-7. See also pp. 193—4.

The areas of the principal crops for the years 1917-18 to 1926-27 are given in Appendix XXI. A list of the principal crops is given in Appendix XXII.



AREA, OUTTURN AND VALUE OF CROPS, 1926-27.

CSL

1	2			3			4			5			6	
				SOWN AREA (MILLION ACRES).			PRODUCTION (MILLION TONS) (BALES, COTTON.)			APPROXIMATE VALUE CRORE RUPEES (a).			VALUE PER ACRE RUPEES (b).	
				Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.	Total.	Irrigated.	Unirrigated.
Serial No.	Crops.													
1	Wheat	..	..	5.1	4.3	9.4	2.1	0.8	2.9	25.5	9.9	35.4	50	23
2	Barley	..	..	0.3	0.5	0.8	0.1	0.1	0.2	1.1	1.1	2.2	38	21
3	Rice	..	..	0.7	0.2	0.9	0.4	0.1	0.5	3.9	0.5	4.4	56	24
4	Maize	..	..	0.4	0.6	1.0	0.2	0.2	0.4	1.9	1.7	3.6	48	29
5	Bajra	..	..	0.3	2.4	2.7	0.1	0.3	0.4	0.7	3.1	3.8	24	13
6	Jowar	..	..	0.2	0.8	1.0	..	0.1	0.1	0.5	0.7	1.2	22	9
7	Gram	..	..	0.9	3.8	4.7	0.3	0.9	1.2	3.0	9.9	12.9	33	26
8	Oilseeds	..	..	0.6	0.4	1.0	0.1	..	0.1	2.3	0.7	3.0	39	18
9	Sugar (raw)	..	..	0.4	0.1	0.5	0.3	0.1	0.4	5.6	0.8	6.4	139	81
10	Cotton	Desi	..	1.1	0.3	1.4	0.2	0.1	0.3	3.3	0.5	3.8	30	16
		American	..	1.1	..	1.1	0.2	..	0.2	3.5	..	3.5	32	..
		Total	..	2.2	0.3	2.5	0.4	0.1	0.5	6.8	0.5	7.3	..	..
11	Fodders	..	..	2.5	1.7	4.2	..	..	..	7.5	3.4	10.9	30	20
	Total crops	..	..	13.6	15.1	28.7	..	..	..	58.8	32.3	91.1	..	..

(a) Column 3 × column 6.

(b) Yield per acre × harvest prices.

CROPS.

The winter crops are those which like wheat, barley and oilseeds are also grown in temperate climates ; Wheat. the summer crops rice, millets, sugar cane and cotton are definitely tropical. The great export crops are wheat and cotton and the oilseed *toria*, the other crops being generally grown for home or local consumption. But wheat¹ is not only important as an export crop, it is also the staple food of a large part of the population. It can ripen in a comparatively low maximum temperature, but it survives in regions of great heat (provided the heat comes after and not with the rain) because it ripens quickly.² But the limit to cultivation is imposed not by the limit of growth, but by the limit of profitable growth, a limit which is as indefinite as is the change in climate ; and the importance of wheat as a crop varies inversely with the distance east of the Punjab till, in Lower Bengal, its cultivation is practically discontinued.³

In the Punjab, wheat is by far the most important crop, both in area and acreage. Its outturn roughly varies from 3 million tons in good years to 2 millions in bad years, the minimum of two million tons being consumed in the Province, and anything extra being available for export. Thus only that wheat is exported which is not required for home consumption, and this surplus constitutes in effect a famine insurance fund.⁴ The outturn varies greatly but is generally between 5 and 10 maunds⁵ to the acre on unirrigated land and 15 to 25 maunds⁶ on irrigated land. As the surplus available for export depends on the unirrigated outturn, the importance to exporters of getting accurate forecasts of this outturn is obvious. The value of the wheat crop has increased and may be expected further to increase with the spread of the better yielding wheats issued by the Punjab Agricultural Department. Wheat is grown all over the Province and on all classes of land except the very lightest

¹ *triticum vulgare* (vernacular *kanak*).

² *Dickson*, 238-9.

³ *Agricultural Practice*, 90-1.

⁴ *P.A.R.*, 492, *Roberts* 99 ; *Agricultural Practice*, 33

⁵ 7 to 13 bushels.

⁶ 20 to 33 bushels.



unirrigated high land. The heaviest type of soil is not well suited to wheat-growing in this dry climate; but such very heavy land is very rare in the Punjab. The district producing the greatest quantities are those watered by the "Lower" (western)¹ perennial canals, for the conditions of the water-supply there favour the growing of a very high proportion of wheat. In fact, on most of the perennial irrigated areas, wheat occupies between 40 and 50 per cent. of the total area cropped in the year. The well-lands in the central districts are credited with the heaviest yields per acre; this is due more to the fact that wells are sunk on selected soil, which is also manured and very carefully cultivated than to the difference in the nature of the water-supply.² Wheat is, however, not suited to intensive cultivation of this kind, which could far more profitably be devoted to potatoes or other vegetables, and it is conservatism and not calculation which induces the tenant of such small holdings to grow a crop which will feed himself and his family.³ Though best sown between the middle of October and the middle of November wheat can be put in later; and in the Northern Punjab, if the winter rains are late, it may be sown up to the first week in January.⁴ Four waterings including the one before sowing, i.e., a total of about twelve inches, are regarded as the minimum number which are ordinarily needed for a maximum crop on most of the light unmanured soils which are commonest in the Canal Colonies.⁵

All Punjab wheats are affected to some extent by rust,⁶ which tends to appear suddenly and spread rapidly if there are spells of cool cloudy weather in the spring. An early attack of rust is more serious in its results than one in late February or March; during the latter month rust will badly

¹ i.e., the Lower Jhelum, Chenab, and Bari Doab Canals.

² P.A.R., 493.

³ Brayne, 56.

⁴ Gazetteer, 59.

⁵ Roberts, 100.

⁶ a kind of fungus (*puccinia Sp.*) causing a wheat disease characterised by rust coloured spots.

damage only the late sown crops.¹ In many cases it is very frequently some very minor factor which will decide to what extent the disease will prevail.² A slight difference in the level in a field with resultant waterlogging in the rains, and consequent destruction of nitrogen owing to the anærobic conditions locally developed will result, as the consequence of nitrogen starvation, in a weak plant being incapable of resisting the attacks of the fungus.³ The only measure possible against rust is to find a variety of wheat immune from it and otherwise satisfactory, and this has not yet, been done.⁴ Premature hot winds when the crop is flowering are another danger to the ripening crop.

The time of wheat harvesting is remarkably regular year after year. In most places in the plains it starts on the festival of Baisakh, about the 12th or 13th of April. In the south-east Punjab harvesting starts a fortnight earlier. The harvesting has to be finished as quickly as possible, for in this hot dry weather the wheat ripens very suddenly, and any delay means very serious loss from the shedding out of the grain.⁵ Till the last moment the farmer is never safe. Hail-storms (which are common in April) may ruin a splendid crop and rain may rot the grain on the threshing floor. The value as fodder of the chaff⁶ trodden out by the oxen is steadily increasing. Roughly the proportion between the yield of chaff and grain in the Punjab is rather less than $1\frac{3}{4}$ of chaff to one of grain. A few years ago wheat chaff, though always valued in the unirrigated⁷ districts or in the towns, was only worth 4 annas per maund in villages, in districts of plentiful irrigation, or in the riverain tracts. It was especially cheap in the Canal Colony villages. But for some years the price has been rising steadily, and this has been greatly accentuated by the Army purchase during the War, so that it now frequently sells for a rupee a maund or more in the villages. Thus the value of the chaff has become an important part of the total value of the crop. Chaff,

¹ Roberts, 101.

² *Agricultural Practice*, 103.

³ *Agricultural Practice*, 103.

⁴ Roberts, 101.

⁵ P.A.R., 404.

⁶ *bhusa*.

⁷ *barani*.



mixed with such chopped green fodder as is available, forms the basis of the bulky food for cattle during the winter and early summer.¹

On soils which are light, lacking in humus or moisture, or ill-cultivated, barley often takes the place of wheat, and when these conditions are intensified, gram often takes the place of barley as the winter food grain. Just as a man may secure himself against loss by backing a horse both ways, so the peasant will often sow wheat, barley and gram mixed, trusting to recoup his losses on wheat from the hardier barley and gram if the spring rains fail. Barley is also useful as a catch crop, since it can be sown later than wheat. It is grown extensively for the breweries and as fodder.² As might be expected, barley and gram are favourite crops in the sandy south-east bordering on the Rajputana desert, though the more fastidious taste of modern times with its preference for wheat as a food grain to the coarser barley, gram or millets has tended to increase the area under wheat even in tracts which are mainly self-supporting.³

The world's crop of barley⁴ is estimated at about one-third the weight of the world's wheat crop. But the acreage of barley in the world is not a quarter that of wheat. In some places (*e.g.*, England) a large area of barley is grown because it can command a high price for malting in the preparation of alcoholic drinks, in others a large area is grown because the climatic conditions are not favourable to the growth of other cereals. Where neither of these causes comes into play the area of barley is generally but a small proportion of the cereal area, and much smaller than the area of wheat. In all India the barley crop usually occupies 7 or 8 million acres as against about 30 million acres of wheat. Most of this barley is grown in the United Provinces, where the area of barley is nearly as great as that of wheat. The area in the Punjab is commonly rather over

¹ *P.A.R.*, 496.

² *Gazetteer*, 60.

³ Attock Tahsil Settlement Report, 61.

⁴ *Hordeum vulgare* vernacular *jau*.



2 million acres or about 4 per cent. of the total area of all crops and only about 1/9th the wheat area.¹

Of the pulses, by far the most important is gram²
Gram. a leguminous winter crop. It is probably

indigenous in south-eastern Europe or south-western Asia. Its cultivation in India is ancient, as its Sanskrit name *chanaka* (Hindustani *channa*) indicates. The area grown in the Punjab is about 4 million acres, of which only about 12 per cent. is irrigated. Gram is sown early, from the middle of September to the middle of October, generally on land which lay fallow in the summer, but it is also often grown after the millets, when they are sown early for fodder. It is often sown mixed with wheat, linseed, oilseeds, barley or peas. It is sown on all soils from the heaviest clay loams to the lightest sandy loam; but it is on the former class of soil that it yields best, and it is generally grown alone in such cases. But it fares better than any other crop on the lightest soil of the Province, and is often in such cases grown mixed with wheat or with barley. Should winter rains be favourable, wheat or barley give as good a yield, whereas gram subsists best when rain fails. The seed bed is generally roughly prepared, but a deep tilth is favourable, though the soil need not be pulverized as in the case of wheat. Gram has always been a staple crop in the semi-desert tracts of the south-east,³ but it has recently also assumed considerable importance in the sandy deserts between the Indus and Jhelum, where the railway built for purely strategical reasons has rendered it marketable, since it can be sown on those desert tracts, if there is ever so little rain in September. The extension of this kind of cultivation is, however, hampered by the fact that the partition of land within that area has been prohibited by law, in view of the possible extension of irrigation if the Thal Canal is made. In this case Government will acquire three-fourths of the uncultivated area of the jointly held lands in these deserts.⁴

¹ P.A.R., 500.

² *cicer arietinum* (arietinum—ram-like from the resemblance of the seed when farming in the pod to the head of a ram) vernacular *channa*.

³ Ferozepur, Hissar, and Rohtak districts.

⁴ A.C.M., 6, *Gazetteer*, 50, *Roberts*; 155-7.

The summer crops corresponding to wheat, barley, and gram are maize, great millet¹ and spiked millet² which are staple summer food grains, maize being grown where there is most moisture and intensive cultivation. Thus maize prevails in the hill and submontane areas, which get the full force of the monsoon, spiked millet in the relatively barren areas of the south-east and north-east, great millet elsewhere. All these three can be grown either for grain or fodder, in the latter case they are sown more thickly, though in dry years crops grown for food are often used as fodder. Maize is mostly grown in the submontane districts, its chief centre being Jullundur. In the Canal Colonies maize is chiefly grown for grain, whereas great millet is almost exclusively grown for fodder³ and generally nowadays as a mixture with *guara*,⁴ a hardy summer crop grown both for seed and as a fodder crop. Spiked millet is rarely grown in the colonies. The area under maize, depending as it does on irrigation and safe rainfall conditions, does not vary much from year to year. The area under the millets fluctuates enormously,⁵ falling to 2½ million acres in the dry summer of 1918 and rising to 4½ million acres in the record monsoon of 1921.⁶

Rice⁷ is a more specialized summer crop than any of these. Its cultivation is a difficult art, as it can only be grown under special conditions. Temperature must average at least 70° F. during the sixth month of growth, and during most of that period the water supply must be under complete control. In the Punjab these conditions are only reproduced in the montane and submontane stream-irrigated areas, and in the heavy half waterlogged soils of the river beds or drainage channels in the plains. "Land under rice seems to be

¹ *jawar*.

² *bajra*.

³ being then denominated *chari*.

⁴ *cyanopsis psoralioides*.

⁵ *P.A.R.*, 507; *Gazetteer*, 60; *Roberts*, 148-54.

⁶ See Appendix XXI.

⁷ *Oryza sativa* (vernacular *dhan*).

able to manure itself provided the supply of water is adequate. Unlike most other cereals, large yields are produced by the same land year after year without the addition of any nitrogenous manure. In spite of continuous cropping no diminution in fertility seems to be taking place; the gains and losses of nitrogen appear to balance each other. More important than the nitrogen supply is the question of drainage." The maintenance of sufficient permeability in rice soils, so as to allow of a slow stream of aerated water from the surface to the roots, is an important matter. Rice, while occupying 40 per cent. of the net cropped area of food-grains in India, is relatively unimportant in the Punjab, where the area never exceeds a million acres, or a little over 1 per cent. of the rice acreage of India.¹

Adequate water is also necessary for sugarcane, a crop important on account of its possibilities in a country which still imports sugar from Java, rather than for its small Punjab acreage of under half a million acres. The proportion which sugarcane bears to the total area of crops in the Punjab is usually rather less than $1\frac{1}{2}$ per cent. None the less the crop has an importance greater than that indicated by these figures. For the value of the return per acre is high in comparison with that from most crops in the Province: and, moreover, the amounts of labour, manure, and water which go to the production of an acre of sugarcane are several times greater than the amounts expended in the production of an acre of most other crops.

Of the Indian sugarcane producing provinces, the Punjab stands second to the United Provinces alone. The area annually under this crop is rather less than half a million acres—which represents some 18 per cent. of the total area under sugarcane in British India. It is generally considered to be one of the best paying crops which the average cultivator can grow on irrigated land, and its area is only limited by the amount of water available for irrigation.

¹ *P.A.R.*, 506; *Roberts*, 118-20, *Dickson* 235; *Indian Agriculture*—39-40.



So far as water requirements are concerned, it makes greater demands than any other crop, requiring during its growth (in districts of light rainfall) some 12 to 15 irrigations as against four for wheat and five to eight for cotton. In the Canal Colonies of the Punjab, the average cultivator puts one acre per square (of about 25 acres) of his land under sugarcane. From this area he eventually gets about 30 to 50 maunds of crude¹ sugar, which is the form in which he usually disposes of this crop. But with better varieties of cane which contain a higher percentage of juice, yields of 80 to 90 maunds of crude sugar are being obtained on fairly good lands.²

In the Punjab the sugarcane crop is planted in March and it is harvested in the winter, from December to February or early March. The crop thus actually occupies the land for almost exactly a year; but for practical purposes it must be regarded as occupying the land for upwards of fifteen months. For the soil must be particularly thoroughly prepared for cane, and moreover after the cane is harvested the soil seems to be left in very poor tilth and encumbered by the stumps. Thus more time and labour is required to prepare land for (say) cotton, when sugarcane has been grown on it, than when it is cumbered with the stubble of wheat, *toria*, or Indian clover³. After the cane has been planted and before it appears above the ground the field is hoed, this serving the double purpose of improving the texture of the soil and conserving the soil moisture. The field is then gone over again with the clod crusher⁴ and, where the land is irrigated, is laid out in beds for that purpose. Where canal water is available, these beds are of the roughest type. The land is merely flooded and no attempt is made to irrigate by furrows or to use the water as economically as possible, as is the case when the land is irrigated from a well. The number of irrigations given varies from eight or ten on the Western Jumna Canal, where the rainfall is comparatively good, and the soil retentive of moisture, to sixteen

¹ *gur*.

² *P.A.R.*, 510; *P.A.R.*, (1922-23), 130; *P.A.R.*, (1923-24), 187
P.A.R., (1924-25), 196; *A.J. I.* (Nov. 1923), 584.

³ *Senji*.

⁴ *schaga*.

or eighteen on the Lower Chenab Canal where the rainfall is scanty and the soil relatively dry. The cultivation after the cane has appeared above the ground is confined to weeding and hoeing. At least four hoeings and weedings are considered necessary and more are frequently given. After the cane has reached a few feet in height it is impossible to penetrate into the crop and further cultivation ceases¹.

The rainfall in the Punjab plains is nowhere sufficient for the growth of sugarcane; and thus this crop can only be grown either under irrigation or where, as in the riverbeds, the underground water replaces irrigation. It can only be grown profitably on land which is at least moderately heavy; it is useless to try to grow sugarcane on the lightest soils². In tracts which become waterlogged, or in which the subsoil water table rises within a few feet of the surface, only very inferior varieties of cane can be grown. The rise of the subsoil water table has thus an important bearing on cane cultivations³.

The bulk of the cane grown in the Province belongs to one of two varieties. Most of the cane grown for the production of sugar is of the variety called *katha*, while that grown for chewing consists mainly of the variety called *ponda*. *Ponda* is a thick green cane not unlike those grown in other parts of the world. *Katha*, on the other hand, is a thin fibrous cane, not more than half an inch thick. The best areas for the growth of cane are in the south-east of the Province⁴. Next after these come the submontane districts⁵. It is only in such parts that any varieties thicker than *katha* are grown for the extraction of sugar.⁶

The Agricultural Department's farms at Gurdaspur and Lyallpur are directing their attention to selecting from good types of sugarcane which have been evolved at Coimbatore,⁷ those which can be easiest acclimatised in the Punjab. Two

¹ *Sugar*, 93.

² *P.A.R.*, 513.

³ *Sugar* 105.

⁴ in the Rohtak and Karnal districts.

⁵ e.g., Gurdaspur and Sialkot.

⁶ *P.A.R.*, 512.

⁷ in the Madras Presidency.

important new varieties have been thus evolved—Co 205 and Co 223. At the Lyallpur farm Co 223 gave a maximum yield of 90 maunds 15 seers of *gur* per acre on a 1-9th acre plot. This was the highest yield on the farm. Co 205 which has topped the list these for the past two years gave a maximum yield of 88 maunds per acre on the same area. The highest average yield on an area of 3 acres in 1924-25 was 81 maunds from Co 223 and 15½ maunds from the local *katha*. These were on irrigated lands. But Co 205 has also done well on unirrigated lands. It has a good root system and stands drought well, and being very hard when ripe is not much interfered with by animals or by passers-by picking and chewing it¹.

These new varieties are just beginning to be taken up by the cultivator. But varieties such as these, yielding a higher proportion of juice, will require a proportionately great amount of fuel to extract the sugar. These higher yielding canes cannot, indeed, produce sufficient fuel for the evaporation of their own juice. Moreover the destruction as fuel of the large mass of foliage provided by the crop is highly uneconomic, as these leaves contain a large part of the plant food which the crop has removed from the soil, and are therefore valuable as manure. These difficulties are being met by the Agricultural Department, which has designed furnaces, whose simplicity of design renders them suitable for use by the ordinary cultivator, while they enable both the fuel consumption and the time expended in evaporation to be reduced by one half.²

India is in point of area the chief grower of sugarcane in the world (the total area in India being rather less than 2½ million acres) and the Punjab has the second largest area among the provinces. But as regards yield India is far below other countries and the Punjab is similarly far below the rest of India. Thus the yield of cane in Java and the Sandwich Islands is said to be over 30 tons per acre, and the yields of refined sugar about 3½ and 8 tons respectively. In

1 *J.P.A.R.*, (1924-5), 196.

2 *P.A.R.*, (1923-4), 188.

Bombay and Madras the yield of raw sugar¹ per acre is generally estimated at between $2\frac{1}{2}$ and 3 tons per acre. The official estimates for the Punjab are not generally much over $\frac{3}{4}$ of a ton of raw sugar; and certainly 1 ton per acre is an average good crop in most parts of the Province.² The intensive cultivation necessary if higher yields are to be obtained will only be forthcoming if sugar refineries, commanding larger areas of cane, are in a position to extract a higher proportion of sugar from the cane than the primitive mill now used, and thus to pay the grower more than he gets now.³

Cotton. The necessity for an adequate supply of raw cotton, and more particularly staple cotton, is one which is exercising the minds of cotton manufacturers throughout the world, and particularly in Lancashire, whose prosperity may be said to be built on cotton.

For over a century Lancashire has relied mainly upon the United States of America for her raw cotton, and this source of supply is not only diminishing but actually threatens to dry up within a calculable period of time. This is due both to a diminished American crop and an increased American mill consumption. American production of raw cotton reached its maximum expansion in 1911-12 when the crop exceeded 16 million bales;⁴ since then the crop has steadily contracted owing to the depredations of the boll-weevil, and now it is anticipated that the crop will not again exceed 12 million bales. At the beginning of the twentieth century home consumption in the United States of America amounted to only 36 per cent. of the crop of 4 million bales. To-day it has reached 55 per cent. or $6\frac{1}{2}$ million bales. Lancashire business men must, therefore, look to other fields for the supply of raw cotton, and strenuous efforts have been made to foster development within the Empire. The most promising countries appear to be the Sudan, Nigeria, and India.⁵ With

¹ gur.

² P.A.R., 511.

³ P.A.R., 511; Keatinge A.P. 30-40; Keatinge 184-92; Indian Agriculture, 40-1.

⁴ of 500 lbs.; the Indian bale is only 400 lbs.

⁵ A.J.I. (Sept. 1924) 473-4.

the exception of the north-east, cotton is produced in most parts of India, but it is chiefly grown in the western half of the country. The area under cotton cultivation is only about one-third less than that in the United States of America, yet owing to the low yields that are obtained, the crop is only one-third as large as the United States crop. Between 1912 and 1921 the average area under cotton was 22 million acres; the average crop was $4\frac{1}{2}$ million bales,¹ while the average yield per acre was only $81\frac{1}{2}$ lbs. of lint, as compared with a yield of 170 lbs. of lint per acre in the United States for the same period. In the post-War boom of 1919 the Indian crop rose to $5\frac{3}{4}$ million bales grown on $23\frac{1}{3}$ million acres, with an average yield of 99 lbs. per acre; but with the restoration of more normal conditions the crop fell to 5 million bales in 1922 and 1923.²

The problem of growing more cotton in India is really an economic one, for it comes into competition with several common Indian crops, and its more extensive cultivation is dependent upon its relative value as compared with theirs.³ In the Punjab cotton is grown wherever irrigation is possible excepting in the montane and submontane areas. Four-fifths of the crop is normally irrigated, and it is only in the extreme south-east of the Province that a moderate yield is sometimes obtained without irrigation. The season in the Punjab is much shorter than in other provinces on account of the cold weather, and unless the crop is sown early with the help of irrigation water, it can never yield well. The best yields are obtained in the south-east and in the western Canal Colonies. Cotton can be grown on any class of soil, excepting the very lightest. It is a crop which gives a good return if grown on manured land. It is very seldom manured directly but is often grown on land which has received a heavy dressing of farmyard manure for some previous crop.⁴ Irrigated cotton is usually sown in April and in the south-west of the Province sowing continues up to the end of June. Unirrigated cotton is sown at the end of

¹ of 400 lbs.

³ *Johnson*, 89.

² *Johnson*, 80.

⁴ *P.A.R.*, 516.

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June. The seed is either scattered or dropped by hand behind the plough. For American cotton in the Canal Colonies, sowing in lines has been introduced and this practice is gaining in favour, the land being first levelled and ploughed, the best growers ploughing two or three times. Subsequently it receives little cultivation, but two or three months subsequent to sowing, the native plough is run through the crop, a process which doubtless destroys weeds, but often (especially in broadcasted cotton), some cotton plants as well. The beneficial effects of harrowing the young crop are beginning to be appreciated.

As the area under cotton is small as compared with that under other crops, cotton seldom follows cotton in the rotation, but is planted after *toria*, rape, maize, gram, sugarcane, or wheat. It is, however, considered undesirable for, cotton to follow wheat, as sufficient time is not available between the crops to allow of proper land preparation prior to cotton sowing. Cotton picking begins in September, and from five to seven pickings are usually made. The picking of American cotton continues until December. It is usually done by women or children, who are generally paid in kind, and the cost works out at about 10 per cent. of the crop. The average yield varies from 80 lbs. of lint per acre on unirrigated land to 160 lbs. on land under irrigation. With the exception of Madras and the Central Provinces this is the lowest yield of any Province in India. Much good could be done in improving the yield were the cotton planted in rows, so as to allow interculture¹ in between.

Assuming an all-round average yield for the Province of about five maunds of seed cotton² per acre, which, when ginned, will yield about one-third of lint or fibre and two-thirds of seed, the total yield on the pre-War average area comes to about $7\frac{1}{2}$ million maunds of *kapas* or $2\frac{1}{2}$ million maunds of lint (equivalent to $\frac{1}{2}$ million bales).³ By 1926 this had risen to $\frac{5}{8}$ million bales. But it must be remembered that the whole of this amount does not reach the

¹ Johnson, 114.

² *kapas*.

³ of 400 lbs.

ginning factories, for the total amount kept for ginning and spinning by hand in the villages is very large, though it tends to decrease. The average so used is estimated at 100,000 bales; but the amount withheld from the general market varies very greatly from year to year according to the fluctuations in the prices of cotton and also of piece-goods.¹

There are two main classes of cotton in the Punjab—the indigenous country² cotton which is itself a mixture of varieties, and the American which is a comparatively recent introduction. These varieties are very different in appearance, the American being a bushy plant, whilst the country cotton plant is tall and slender.³ Punjab American cotton is probably derived from a general distribution of American seed that took place in 1903, the seed of which became hopelessly mixed with that of the native varieties. An improved variety of this type has been developed as the result of careful selection at Lyallpur Agriculture College. It is distinguished as 4 F. Distribution of its seed was commenced in 1913 and it is rapidly replacing the original type. The length of the staple of 4 F. is fully $\frac{7}{8}$ inch. It demands better cultivation than is necessary for country cotton, but provided soil and water conditions are satisfactory it competes favourably with the latter. Two later developments 285 F. and 289 F. are giving more satisfactory results in certain localities. As American cotton requires a longer growing season than the indigenous varieties it is all grown under irrigation, and mainly in the western part of the Province. If American cotton only yields at the same rate as country cotton, and sells at a premium of Rs. 3 per maund owing to its superior quality it gives the grower an extra profit of Rs. 18 per acre. It could probably be advantageously cultivated under well irrigation in the eastern Punjab, where the rainfall is heavier, as it stands heavy rainfall better than country cotton. Throughout the Province, except in small tracts in western districts, the predominating country

¹ P.A.R., 517.

² *desi*.

³ P.A.R., 518.

cotton is a yellow flowered type,¹ which has a staple of $\frac{3}{8}$ to $\frac{1}{2}$ inch. Nearly every field of country cotton contains at least four varieties. In the important cotton-growing areas in the south-east, the old-established country varieties are still retained. Of these, investigations have demonstrated the superiority of a white flowered type² as regards lint percentage.³ From this the Agricultural Department has evolved a type which yields a lint percentage of 37 as compared with the 33 to 34 per cent. yielded by the local variety. It is also a heavier cropper and has given as much as 1,476 lbs. of seed cotton per acre in the hands of the farmers. Various other types have been isolated and selected from the mixture of indigenous varieties.⁴

The cotton acreage has risen from $\frac{3}{4}$ million acres in 1915 to $2\frac{3}{4}$ million acres in 1925. The area has fluctuated with the price of cotton, rising to 2 million acres in the post-War boom and reacting with the subsequent fall in prices. Since 1922, however, the rise has been steady, and is almost entirely due to the increased demand for the new varieties of Punjab American cotton. Nearly half the acreage, and more than half the value, of the cotton grown is now under Punjab-American cotton; and cotton now stands definitely as the most important crop in the Province after wheat. If the artificial premium now put on winter irrigation were removed and some of the water which now flows uselessly down to the sea in the summer were available, cotton might soon rival even wheat for the position of the premier crop of the Province.⁵

Cotton often follows *toria*,⁶ a late summer oilseed of growing importance in the Canal Colonies both for export and local oil extraction. The oil-cake is valued as a cattle food, while the oil is used for

¹ *Gossypium indicum*.

² *Gossypium neglectum*.

³ i.e., the percentage of lint obtained after ginning to the total seed cotton (*kapas*) before.

⁴ Johnson, 112-4.

⁵ P.A.R. (1922-3), 123-5.

P.A.R. (1923-4), 182-4.

P.A.R. (1924-5), 191.

⁶ *brassica campestris* var. *toria*.

cooking in India, and in Europe finds a variety of uses, one of which is as a substitute for olive oil. It is sown early in September or even sometimes at the end of August, and is hence known as a late summer¹ crop.

It ripens in January, and is rarely grown for fodder, in contrast to the other important oilseed, rape,² which ripens in March, and is a definitely winter crop, mostly grown on unirrigated land, and mixed with gram, barley or wheat being sown at the same time. Rape is also used as vegetable.³ Another oilseed *taramira*⁴ is grown fairly extensively in dry tracts, but mustard⁵ is rare in the Punjab.⁶

Highly manured land near villages grows turnips, carrots, and similar produce.⁷ Such roots are increasing by importance as fodder for cattle, but the demand for green vegetables as a food for man is limited though increasing. More important as an article of food is the potato, which will produce between twice and thrice as much food per acre per crop as wheat.⁸ Germany was the first to grasp the importance of this fact for a nation whose area of food-supply might be limited in war. She replaced most of her wheat by potatoes, so that the gross weight of her potatoes was twice that of all other crops put together, and it was the potato more than any other single fact that enabled her to tide over the difficult period before the Treaty of Brest Litovsk⁹ threw open to her the granaries of the Ukraine.¹⁰ The lesson is being brought home to the small-holders of the congested submontane districts of the Punjab, who can only hope to earn a livelihood by the substitution for wheat of intensive crops, and particularly the profitable potato, the area under which is increasing, especially in the hills and on well-irrigated land near large towns.

¹ *zaid kharif*.

² *brassica campestris* var. *glauca* vernacular *sarson*.

³ *sag*.

⁴ *eruca sartiva*.

⁵ *brassica juncea*, vernacular *rai*.

⁶ *P.A.R.*, 509; *Gazetteer*, 61; *Roberts*, 160-5.

⁷ *P.A.R.*, 519.

⁸ *Calvert*, 212; *Adam Smith* I ii (I).

⁹ p. 42.

¹⁰ *Calvert*, 212; *Keatinge*, *A.P.* 21-2; *Claphan*, 56.



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The potato is principally a garden crop in the Punjab. In the plains generally two crops of potatoes are taken in one year on the same land. The first crop is sown in the month of September and harvested in the month of December-January, while the second is sown in January-February and gathered in the month of May. After the second crop is removed the land is either allowed to remain fallow till September or put under maize for fodder or some other quick growing vegetable crop in the rainy season. Potatoes are propagated by vegetative reproduction and after a time the tubers lose their vigour and deteriorate in quality and yielding capacity. To remedy this rejuvenation is necessary by sexual reproduction. A case in point is the potato growing of the Simla Hill States. Since their first introduction about forty years back potatoes have been propagated there from tubers year after year. The result is that they have deteriorated and their cropping and disease resisting powers have been much reduced. To replace these potatoes the Agricultural Department some few years back introduced some varieties of Scotch potatoes which had been raised from seeds comparatively recently. The results so far have been very promising and there is a great demand for the newly introduced varieties for seed. Comparative tests shewed that Scotch potatoes grown in the Simla hills gave Rs. 100 more per acre than the old local varieties, in spite of the fact that very heavy rains during the ripening period had rotted a considerable portion of the tubers.¹

Investigations are also being made into the question of improving indigenous methods of fruit culture.

Fruit. With better methods of growing and marketing the Punjab should take a leading place in the world's production of citrus² fruits, which are particularly suited to dry climates such as that of the Punjab or California, while the submontane regions are ideal for mangoes and figs, and plaintains, pomegranates, plums and peaches can be

¹ Roberts, 177-9; P.A. R., (1023-4), 189.

² A genus of *rutaceae* including oranges, lemons and limes.



grown in various parts of the Province,¹ and in the south-west the date palm flourishes. Plantains grow well in many parts of the Punjab and in some places where transport facilities are poor, they grow almost wild and fruit abundantly. It is probable that the difficulty of their marketing might be overcome by drying the edible part of the fruits, packing it in boxes or tins and selling it in the dried form. The case wants investigation. All over the Province similar problems arise which might be solved if attention could be devoted to them.²

A particularly popular fruit is the melon.³ There are a very large number of varieties and forms and some districts⁴ are famous for the quality of the melons grown there. It is grown on the sandy banks of Indian rivers, and also as a cultivated field crop both irrigated and unirrigated. It is sown in February and March and ripens in May and June. The seed rate is about two seers per acre, and the seed is sown broadcast. In the colonies it is often grown with cotton, the field being manured beforehand. The fruit is much appreciated during the early hot weather months. If a suitable market is at hand, the crop is a very paying one, and often gives a gross return of Rs. 200 to 400 per acre.

In spite of their possibilities for fruit growing, the submontane tracts are still mainly devoted to the cheapest form of millets, because millets were the customary things to grow before the great Canal Colonies ensured a regular supply of wheat, and railways were constructed to distribute it. This utilization of land for crops other than those which would prove most profitable is a most expensive luxury for the Province.⁵ Higher up in the hills a number of fruit farms have been at work for several years. Most of these were started by Europeans, who no doubt found the climate of the hills more congenial than that of the plains. These farms are situated chiefly in the distant Kulu Valley and Simla hills.

¹ P.A.R., (1923-4) 189, A.C.M., 272.

² A.C.M., 272-3.

³ *Cucumis Melo*. vernacular *kharbuza*.

⁴ e.g., Jullundur and Ferozepore.

⁵ Calvert, 209.

Apples, pears, peaches and other fruits, most suitable to a temperate climate, have been imported from various countries by the owners of the farms, and some excellent specimens of fruit now find their way into the Simla and other markets. This proves that excellent fruit can be grown, and farmed at a profit. Transport difficulties, however, have hindered development in many cases. Fruit from the Kulu Valley, for example, has to be carried for over a hundred miles by road down through the Kangra Valley to the railway station at Pathankot; but, in spite of this, there is a considerable trade of the more easily transportable fruit from that valley. The opening of the Kangra Valley Railway has given a great stimulus to fruit farming in these parts.¹ Improved transport will also facilitate the canning of such fruit as cannot be immediately disposed of, the cost of which has hitherto been prohibitive owing to the cost of transporting to the fruit gardens the tin required for canning. The lack of enterprise which has hitherto limited the boundless possibilities of the Kangra district is most evident in Dharmsala, whither California peaches are brought in tins round half a hemisphere and a hundred miles from the railroad, though the climate of Dharmsala is pre-eminently suited to the growing of such fruit. In the development of intensive agriculture of this type lies the chief hope for the future of agriculture in the small holdings which abound in the congested districts of the Central Punjab. The large towns in the neighbourhood provide a convenient market. But intensive agriculture will only be prosperous in the hills when communications are sufficiently developed to allow of the produce being marketed at remunerative rates.²

There are over $\frac{1}{4}$ million acres of land now under orchards and garden crops in the Punjab and this area is increasing. All over the Punjab new gardens are being laid out and improvements are taking place in many others. There is also an increasing demand from the public for advice and assistance from the Agricultural Department as regards

¹ A.C.M., 271.

² P.A.R., 519.



fruit and vegetable culture. This is connected with the rise in the standard of living which has taken place among the people, the improvements in transport facilities which have greatly extended the distance from which garden produce can be brought to market, and the increasing number of people who are awakening to the possibilities of fruit and vegetable gardening. In view of the value of this produce to the health of the people as well as to the finances of the Province fruit and vegetable culture merits much more attention than it has received.¹

3. BEASTS.

That our oxen may be strong to labour,
That there be no decay.

Psalm cxlix. 14.

Fortes creantur fortibus et bonis ;
Est in juvencis, est in equis patrum
Virtus.²

HORACE *Odes* iv. 4.

With the spread of cultivation the rich variety of wild animal life that once characterised the Punjab as the rest of India, is gradually disappearing. Until the beginning of the nineteenth century both lions and tigers appear to have been common, and the Eastern Punjab was a favourite hunting ground of the Mogul emperors. As late as 1827 lions were sometimes seen within 20 miles of Karnal, while tigers were exceedingly numerous in its immediate vicinity ; and in the neighbourhood of Sirsa and in others parts of the Punjab tigers were abundant until past the middle of the nineteenth century. Lions are now extinct and tigers practically so, though occasionally a straggler from the Aravalli hills is found in the south-east Punjab, or one from the submontane jungles of the United Provinces may cross the border into the Siwaliks below Simla, whither also the wild elephant also occasionally strays. But the

¹ *A.C.M.*, 272.

² This only from the sturdy and the good that sturdy youths are born ; in steers, in steeds, appear the merits of their sires.



Leopard is still common in the hills and other wild tracts, while the wild cat is still more ubiquitous. Two kinds of bear, the black and the brown, are found in the hills; hyenas and wolves¹ are seen in most districts, but are not common; jackals and foxes on the other hand abound. Ibex are found in the higher Himalayas, and lower down are musk deer, barking-deer, and wild goats; in the Salt Range the urial, a wild sheep,² is not uncommon. In the east and south of the Province antelope³ are plentiful, they browse on the growing crops and the religious scruples of the Hindu cultivators often yield to the temptation to sanction their slaughter.⁴ Nilgai,⁵ ravine deer⁶ and hog deer⁷ are also found in places. The wild hog, badger, porcupine, and hare are found in most parts. In the plains monkeys are confined to the predominantly Hindu south-east of the Province, but they abound in the hills, where also the fierce grey ape⁸ is to be found in places. The otter and river porpoise are found in all the rivers, whose banks are often lined with crocodiles basking in the welcome rays of the winter sun. But in the summer the intrepid bather, plunging into the cool waters swollen with melting Himalayan snow, must beware of the murderous blunt-nosed variety⁹ whose belly is often filed with the bracelets of women who have too venturously dipped their pitchers in the water. The sharp-nosed fish-eating crocodile¹⁰ is however comparatively harmless.

¹ One stifling evening in June 1914 I was outriding alone near Rohtak, when I saw two wolves in single file with their tongues hanging out, evidently parched with thirst, in that baking country. They passed quite close, ignoring me, and evidently simply intent on quenching their thirst.

² *Ovis vignei*.

³ Black buck or Indian antelope, vernacular *hiran*.

⁴ In 1924, when I revisited Sonapat, where I had been Sub-Divisional Officer, 1914-17, the Hindu Jat agriculturists complained that my Indian successors never shot black buck, which now devoured the growing wheat within sight of the Sub-Divisional Officer's bungalow.

⁵ i.e., blue cow, a deer which in appearance resembles a cow, and to shoot which is therefore forbidden to strict Hindus. But the manly Hindu Rajputs of Kangra used to come and help me shoot them, another proof of the indifference of the Punjab Hindu agriculturist to the stricter rules of the urban Hindu traditions.

⁶ *chinkara*.

⁷ *parha*.

⁸ *langur*.

⁹ *crocodilus palustris*, vernacular *magar*.

¹⁰ *gavial*, vernacular *ghariyal*.

More interesting, because more visible is the rich bird life of the Province. The predatory kites and hawks abound everywhere, and woe to the small bird which is caught napping too near them, and cannot speedily find safety in tree or shrub. In the treeless plains of the south-west no small bird dare face them, and even in Lahore kites and crows will carry off spoons from the out-of-doors tea table, which is left for a moment unwatched. Crows and dogs and the cowardly vulture are always on the alert for the dead and the dying, and the fate of Jezebel¹ is often recalled by the sight of a stinking carcase given to be meat for dogs and the fowls of the air. It is pleasant to turn from these carrion feeders to the beautiful colours of the blue jay and wood-pecker, the glory of the golden oriole flashing through the trees and the green parrots so well camouflaged in the leaves as to be recognised only by their screeching. Tamer are the jolly myna² starling which makes a delightful pet, and the jungle babblers³ or seven sisters, always seen in groups of about seven, giggling and gossiping together like flappers at a fair. The sparrow also is common, but not so common as in England.

The hot weather is enlivened by the visit of immense flocks of rosy pastors.⁴ Less cheering are the ear-piercing shrieks of the hawk cuckoo⁵ and the monotonous tang of the coppersmith⁶ which like St. Paul's Alexander (also a copper-smith) often "did me much evil"⁷ in the hot weather.

Peafowl are common in the east of the Province, where rules based on Hindu susceptibilities alone preserve them from massacre by the unsporting sportsman, to whom they fall an easy prey.⁸ Far better sport is afforded by the

¹ ii. Kings ix. 36.

² *Acridotheres tristis*.

³ *Crateropus canorus*.

⁴ *Pastor roseus*.

⁵ *Hierococcyx sparverioides*, vernacular koil generally known as the hot weather bird.

⁶ *Xantholaema haematocephala*.

⁷ ii. Timothy iv. 14.

⁸ The past utility of the Hindu rules forbidding slaughter of sacred animals may well be admitted even by those who would now have them modified.



flocks of sand-grouse¹ which draw the overworked official into the pure keen air and brilliant sunshine of a winter in the Punjab desert. The grey partridge is found everywhere, and the black partridge is occasionally met with ; in the hills the *chikor*² and *sisi*³ partridges are common, and the snow partridge is found at high elevations. All the Indian pheasants are found in the Himalayas.⁴ Bush-quail and rain-quail are found in the plains and the common grey quail comes in hosts at the ripening of the wheat. In the winter large numbers of waterfowl visit the rivers and lakes. Of duck the most common are the sealing-wax bill, pintail, mallard, pinkhead, shoveller, teal and goose teal ; while geese, cranes, flamingoes, pelicans, ibises, herons, bitterns, and snipe are all also more or less plentiful.

Snakes are relatively rare in the Punjab and are mainly confined to certain districts.⁵ They are com-

monest in salty alkali tracts and in the
Insects. jungles of the south-east and the submontane areas. About two-thirds of the snakes are harmless, but the little *karait*, the cobra, *echis carinata*⁶ and Russell's viper are deadly. Insects unfortunately shew no tendency to disappear. White ants attack timber and garnered grain, which is also much subject to injury from weevils. Mosquitoes abound and with sandflies combine to make life a burden in the hot season, and house-flies swarm, especially towards the beginning and end of winter. Scorpions and centipedes are numerous but not much seen. The honey-bee, hornet and wasp are common, and the fire-fly's flashing light is to be seen wherever there is irrigation.⁷

¹ Imperial painted pallas, and pintail.

² *Caccabis chikor*.

³ *Ammoperdix bonhami*.

⁴ Including the argus, the gorgeous monal, koklas, chir and white crested pheasant.

⁵ I have only seen about 20 snakes during the 21 years I have been in India, and of these half were in Ambala where I stayed only two years in all.

⁶ *Kappa*.

⁷ *Gazetteer*, 13.



Typical Punjab Peasants ploughing with a Rajah Plough.

Wild animals may afford sport, and occasionally food to the hunter; more frequently the husbandman suffers from their depredations. But it is with tame animals that the economist is mainly concerned. From the earliest times the ox has furnished mechanical power to the cultivator, and the Hindu prohibition of kine-killing gave a religious sanction to the economic necessity of preserving cattle from the destructive instincts of early times.¹ Till quite recently, livestock constituted by far the most important form of movable capital. To this the kindred origin of the words "capital" and "cattle" bears testimony,² and in backward parts of the Punjab to-day the money-lender advances money on their security, his lack of discrimination between good stock and bad encouraging the borrower to accumulate quantity rather than quality in his herds.³ Quantity rather than the quality is in fact the distinguishing feature of the cattle population of India in general and of the Punjab in particular. The quantity of the Punjab cattle may be seen from the following table:—

(Millions).

Year.	Cows.	Cow buffaloes.	Bulls, Bullocks.	Male buffaloes.	Young stock. ⁴	Total cattle.	Sheep.	Goats.
1904 ..	3.0	1.9	4.1	.6	3.7	13.3	4.1	5.5
1909 ..	3.4	2.2	4.2	.6	3.8	14.2	4.6	4.2
1914 ..	3.7	2.6	4.6	.6	4.0	15.5	4.7	4.4
1920 ..	3.0	2.7	4.3	.5	3.8	14.3	4.0	3.1
1923 ..	3.0	2.9	4.5	.5	4.0	14.9	4.1	4.3

¹ L.F.R., 74.

² Marshall, 691; Adam Smith, I, 4.

³ This was the explanation given me for the large herds of worthless cattle in Karnal.

⁴ Young stock means cattle less than two years old.



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The figures do not justify any pessimism as to the number of the cattle population. The increase between 1904 and 1914 coincides with the increased demand for milking and plough cattle created by the development of the Canal Colonies. The check in 1920 was due to a series of bad seasons, combined with large exports for military purposes. The increased demand for milk led to a steady increase in the number of cow-buffaloes, an increase which continued even during the unfavourable conditions preceding 1920. The diminution in the number of bullocks in 1920 was almost negligible and 1923 brought them well up to near the 1914 maximum. The diminution in the number of cows might appear serious but there is no reason to suppose the numbers insufficient for breeding bullocks for the plough. Their value as milk producers is at present only secondary, and the increase in the number of cow-buffaloes would seem to secure the milk supply. There would be no cause for alarm as to the quantity of cattle if it could be assumed that the quality was up to the standard required.¹

But this is a large assumption. The gradual advance of canal irrigation into the grazing grounds of Quality not quantity required. the best breeding stocks: the draining away of the best cows and cow-buffaloes to provide milk for the towns, while inferior animals are left to carry on the breed: the existence of large numbers of half-starved cattle, which compete successfully with the more useful animals for the ever diminishing supply of available fodder; the fact that cattle breeding is not a commercial proposition either actually, and still less when compared with the large profits to be obtained from agriculture in the strict sense of the word; all these causes have combined to produce this deterioration. It is indeed a matter of common observation that a large number of the cows in existence are neither good milkers nor good breeders and that a large number of bullocks are not efficient ploughers. They exist simply

¹ Punjab Cattle Census (1923), 4; *Quirke*, 1; *A.C.M.*, 254; *A.J.I.* (Sept. 1922), 489-92.



in virtue of the free grazing which is available. It would not pay to provide them with expensive fodder, so they remain half-starved. It would not pay to incur trouble or expense on the breeding of such starvelings, so they are allowed to breed promiscuously.¹ The arid grazing grounds on which they feed resemble "the largeness of the open commons of mediæval England" on which "lean animals lingered out a meagre life."²

The whole question of cattle mortality craves attention. The total population of bovines and equines together in the Punjab amounts to some 15½ millions, and the deaths among them must amount to not less than 1½ million annually. As the reported causes of death annually account for under 40,000, it is clear that little is known of the real causes of cattle mortality. It seems probable that the cattle population is too large for the amount of fodder available, and that a large number die of weakness. Under such conditions good milking and draught strains are eliminated, and a famine-resisting breed is developed.³ A severe drain is in this way imposed on the slender fodder resources of the country. Epidemics of disease, and the acute shortage of fodder which follows a failure of the rains, are the only factors which operate to keep the bovine population within bounds. No sufficient excess of fodder is produced in good years, and its bulky nature would prevent the importation of appreciable supplies even were external sources available. Famine, therefore, in the case of cattle reproduces the conditions which formerly existed in the case of human beings when the means of transport did not exist. The beasts die in hundreds and those that survive are rendered insufficient as workers for some time to come.⁴ Hence the difficulty of persuading the cattle owner that it pays to keep a good rather than bad animal. The Punjab peasant is still far from convinced of this owing to the mortality from contagious diseases and

¹ Punjab Cattle Census (1923), 5; *Keatinge A. P.*, 112.

² *Marshall*, 46.

³ *P.A.R.*, 555.

⁴ *Agricultural Practice*, 268.

from starvation. Veterinary knowledge can assist to prevent disease but famine can only be avoided if measures are taken to store fodder against seasons of drought. But here again the difficulty arises that the expense of storing fodder is greater than the animals are worth. Fewer animals of better quality, though costing no more to feed, would give the same amount of draught power and of milk. A restriction of numbers together with fodder storage must therefore precede any general improvement of breed.¹

The difficulty of maintaining an adequate and constant supply of fodder may be illustrated from the conditions obtaining in the Haryana tract of the south-east, which has given its name to one of the finest and most famous breeds of Punjab cattle. A good season in the Haryana districts produces millets, pulses and grass in such quantities that, were the straw properly stacked and preserved, nothing short of a two-years famine of the worst type could reduce the fodder supply below the requirements of all the cattle worth preserving. Unfortunately the crop is neglected altogether, and the millet straw even when carefully cut and collected and not allowed to stand in the field, is only stacked in exceptional cases. Most of the fodder is sold, chiefly for the Delhi market, and any stacks remaining in the villages will be found to belong to local shopkeepers² who are prepared to hold them till the opportunity of reaping famine prices presents itself. Even the excellent and copious grass, which follows a good monsoon, is useless, unless cut at the proper time, which unfortunately coincides with the autumn harvest and the annual epidemic of fever. Consequently the difficulty of stacking grass on a large scale seems almost insurmountable.³

Certainly much might be done in many parts to make better use of the existing fodder supply; but that in itself would not suffice. The people must adapt themselves to the new conditions and realize the imperative necessity for growing fodder crops.⁴ The old

¹ Quirke 2, 5; A.C.M., 255.
³ Dairying, 28.

² bania.
⁴ Keatinge, 123.

grazing areas are largely disappearing as the result of the extension of cultivation, mainly due to canal irrigation but also noticeable in tracts irrigated by wells or depending on rainfall alone.

The following figures are suggestive :—

District or country.	Total Cattle (1923) Millions.	Grazing area (culturable but not cultivated) Million acres.	Number of cattle per acre.
Hissar (district)	49	41	1.2
Rohtak (district)	57	17	3.3
Karnal (district)	76	57	1.3
Jullundur (district)	48	12	4.0
Sialkot (district)	54	18	2.9
Punjab	15.1	17.4	0.9
United Provinces	..	..	2.1
England	..	..	1.3

On the whole the Punjab appears much better off than the United Provinces, though much of the grazing area of the Punjab has little value as pasture except after rain. But in congested districts like Jullundur the fodder question is already acute, a fact which appears only too clearly when the figures are compared with those of England and the quality of English grazing is compared with that of such districts on the average all the year round. It is only by the encouragement of fodder crops that the effects of the continual restriction of grazing can be combated. The real problem arises in May and June when all grazing grounds dry up. Even at their best, however, these grazing grounds are parched tracts covered with coarse and often unnutritious grass. No attempt is made to turn the village common lands into fenced-in-paddocks of properly cultivated pasture,



nor are they ever irrigated even when canal water is available. Everything is sacrificed to the immediate money return of the commercial crops and the idea of soiling the spare fodder crops and grass in the monsoon is still the pious aspiration of pioneers.¹

During the rains there is an abundance of green fodder, both in the natural growth of uncultivated Fodder crops. areas and in crops such as the great millet² grown to supply fodder. With the cessation of the rains and the coming of the cold weather natural growth ceases and the fodder crops ripen off. Fodder is now limited to the dry stalks of millet and maize and to the chaff³ produced from the cold weather cereals, to which must be added the withered grasses of the waste lands. Grains and pulses are little used as cattle food, nor is the use of cotton seed, even in the form of cake, appreciably adopted. On these fodders, having small nutrient value, eked out with such little natural grazing as is available, the cattle have to subsist till the succeeding rains bring forth a new supply. And this is the time when their strength is taxed to the utmost with the winter⁴ harvest and summer⁵ ploughings. This seasonal alternation of plenty and famine is not calculated to build up a robust body, and the ill-effects are particularly marked in the case of young stock. The introduction of a fodder crop to supply green food throughout the year, leading up to stall feeding, is an improvement that requires urgent attention in any scheme aiming at the general improvement of the livestock of the country. The fodder crop which will pay best is that which will give a return during the hot weather when supplies are at their lowest until the rains bring on natural vegetation again. During this season of intense drought no crop will grow without water, and the water supply is therefore the limiting factor. Where water is available, as in

¹ *Brayne*, 32, 63, 66; *Dairying*, 20-3; *Cattle Census Report* (1923) 17; *Agricultural Practice*, 269.

² then known as *chari*.

³ *bhusa*.

⁴ *rabi*.

⁵ *kharif*.

the Canal Colonies, the growth of lucerne is occasionally undertaken.¹ This is a leguminous fodder crop widely grown in small plots over most of the Province. It is perennial and gives from four to seven cuttings per annum. The most vigorous growth is during the rains. It is much valued as a green fodder for horses, and is, therefore, grown largely near cantonments and Army Remount Depots.² *Guara*³ is also a very useful heavy fodder crop, which often reaches a height of five feet in the canal tracts, where it is generally grown mixed with great millet in various proportions, though it is sometimes grown alone. Cattle relish this green fodder, which has a high nutritive value.⁴ The indigenous winter fodder is Indian clover.⁵ But this only gives one cut and is not nearly such a good crop for the land as the Kabuli⁶ and Egyptian⁷ clovers. These latter, however, require more water, and there is a difficulty in getting them to produce seed. But this difficulty is being overcome and on irrigated lands they are slowly replacing the indigenous Indian clover in progressive villages.⁸ Much, too, might be done with the principal indigenous grasses if more information were obtainable as to their nutritive value.⁹

Once the question of fodder is settled, the next essential to progress in cattle breeding is to ensure as much protection as possible against contagious disease, so that cattle owners may not have to suffer the expense of rearing animals which will afterwards fall victims to epidemics. The most prevalent cattle diseases are foot-and-mouth disease (which also attacks sheep and goats), hæmorrhagic septicæmia, rinderpest, blackquarter, and anthrax. Though foot-and-mouth disease is very common, the losses from it are slight, only 2 or 3 per cent. of the cases

¹ *Agricultural Practice*, 196, 267, 271.

² *Roberts*, 172-3; *A.R.B.* (150) 28-9.

³ *Cyamopsis psoralioides*.

⁴ *Roberts*, 165.

⁵ *Mellilotus parviflora*, vernacular *senji*.

⁶ *Trifolium resupinata*, vernacular *shaftal*.

⁷ *Berseem*.

⁸ *Roberts*, 180-2; *A. R. B.* (150); 29-31 *Indian Agriculture*, 44.

⁹ *A. R. B.* (150) 31.

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being fatal. But septicæmia, with a mortality of 90 per cent. is very deadly, especially to buffaloes and during the rains. Rinderpest is common and assumes a virulent form in the hills killing 80 or 90 per cent. of the animals attacked. Sheep, goats and even camels are also subject to this pest. ¹ The mortality, however, varies greatly in different years and also among different breeds of cattle. Cattle imported from Europe are notoriously susceptible to rinderpest, and when they contract the disease nearly always suffer from the acute type and almost invariably succumb. The cattle of the Himalayan foot hills are also highly susceptible, though in a less degree. The cattle living on the plains of India are, on the other hand, relatively resistant, although the different breeds and the animals of different localities vary somewhat among themselves in this quality of susceptibility. An outbreak that would kill off all European cattle would probably destroy only thirty per cent. or less of Indian plains cattle. The explanation of this difference in susceptibility would seem to be that the cattle of Europe, and especially the cattle of western Europe, have for many generations not been confronted with the disease, while on the plains of India it is an ever recurring menace to the existence of the species, and with each outbreak it is the more resistant cattle that survive. Hence, in the course of time, it is reasonable to assume that the races of cattle represented by the ordinary village cattle of India have been evolved, by a process of natural selection, from ancestors that have displayed a relatively high resistance to rinderpest, while on the other hand, the existing races of European cattle need not necessarily represent progeny derived from ancestors possessing these traits. ² Their relative immunity to disease is the outstanding merit of Indian cattle and should render stock-breeding a highly profitable industry in India, not only for home consumption, but also for export to countries such as the Argentine, where the value of a disease-resistant admixture would be fully appreciated.

¹ *Gazetteer*, 64.

² *A.J.I.* (Nov. 1925) 430.

In India, where the bullock is the draught animal in Cattle breed. common use, and where milk products are ing. common articles in the dietary of the people, the evolution of a good breed of cattle is of the utmost importance. Poor draught cattle mean bad cultivation; bad cultivation means poor outturns of grain for the cultivator and of fodder for his cattle; this again means an impoverished cultivator and weak and, therefore, inefficient draught bullocks. How to break this vicious circle is one of the most difficult problems facing the scientific investigator into Indian farming methods to-day; for the standard of cultivation possible is largely dependent on the quality of the draught bullocks available; and the introduction of improved implements on a large scale depends on the existence of bullocks sufficiently strong to work them.

The position, however, is by no means hopeless. Cattle in India to-day are probably but little, if at all, inferior to those which were found in England in the middle of the eighteenth century. By better breeding and feeding English breeds have since that time been improved out of all resemblance to their progenitors. The improved breeds evolved have gained a world-wide fame, and England has become the world's principal stud-farm.¹ The first step, therefore, to be taken towards establishing a good breed is to preach the cult of the bull. In the Punjab the working value of a bullock is greater than that of a bull, and the breeder mainly makes profits by the sale of castrated stock as bullocks. There is not, therefore, the same tendency to selection and consequent improvement of breed.² Moreover, no amount of good breeding will overcome the ill-effects of bad rearing and insufficient feeding; so that it is idle to anticipate good results when these essentials are neglected.³ Even then it is obviously impossible to effect marked improvement in the quality of the cattle of the Province, while large numbers of undesirable males are allowed to run at large among the better-bred females. Fortunately, the popularity of the

¹ *A.J.I.*, (March 1924) 168-9.

² Punjab Cattle Census (1923) 15.

³ *A.C.M.*, 261.

Italian method of castration has led to a very marked expansion of this very important branch of the Veterinary Department's work. The actual operation takes only about 30 seconds to perform and, as it is bloodless, it is becoming very popular even among the most orthodox Hindus.¹

Cattle breeding and cattle disease control connote or-
The Veterinary ganisation, and in India organisation always
Department. implies a Government Department.² In 1868
Lord Mayo, as Viceroy, appointed a Commission to report on
cattle disease in India and the measures necessary for its
prevention and cure. The report of the Commission vainly
recommended a Provincial Veterinary Establishment, and
in 1880 the Famine Commission (sent out from England)
equally vainly called attention to the parlous state of agri-
culture in India.³ Subsequently (in 1882) Lord Hartington,⁴
then Secretary of State, urged that the newly constituted
Department of Agriculture should give early and careful
attention to the subject of cattle disease. It was not, however,
till 1891 that a Civil Veterinary Department was formed, the
duty of combating disease being, however, subordinated to
military horse-breeding requirements. The interests of the
civil population, however, supervened in 1903, when the
Government of India transferred the entire control of horse,
mule, and donkey breeding in fifteen selected districts of the
Punjab to the Army Remount Department; confining the
work of the Civil Veterinary Department in those districts
entirely to cattle.⁵

Since then the Punjab has led India in Veterinary work.
For this purpose it is divided into three Circles, North, South
and Central, each in charge of a Superintendent with a Deputy
Superintendent under him. The subordinate staff numbers
over two hundred. But however great the staff, little head-

¹ P.A.R., (1923-4 212.)

² A.C.M., 254; Quirke, 2.

³ Details as to how this Commission was circumvented by the Gov-
ernment of India are given in L. F. R., 330-1.

⁴ Afterwards Duke of Devonshire, the man who made Gladstone
send out the expedition to relieve Gordon at Khartoum (alas too late!).

⁵ P.A.R., 548.



way is possible against contagious disease unless powers are given to control the movements of diseased animals and to take other necessary effective measures for the control of outbreaks.¹ Recently the Veterinary Department has come to the fore as a Government Department which is not content merely to exist to erect buildings, to create appointments, to raise salaries and to write reports. It is also in contact with realities and has become increasingly popular with the rural population as its beneficent intentions have been gradually translated into action. For a long time subordinate to the Director of Agriculture, its emancipation became necessary when, with the Reforms Scheme, that official was selected not from the Indian Civil Service, but from among Economic Botanists, whose forte was rather cow-cockle than cows, and who applied the meticulous minds of technicians to matters of which they had no technical knowledge. Yet a long struggle was required before (in 1928) the Veterinary Department was finally free to follow its beneficent course unhampered.

The Veterinary College, whence trained experts issue forth to instruct the Province, is a palatial building, equipped on a scale suited to the needs rather of India than of a mere province, and providing an admirable training in English, which is, however, rather in advance of the requirements of the relatively poor Punjab. Economy could be effected if other provinces in India would send their students for training to the Punjab Veterinary College rather than equip Veterinary Colleges of their own. There is no objection to this on the score of such differences in local conditions as might be urged in the case of an Agricultural College, nor does the medium of instruction stand in the way, as the course is given in English. The course extends over four years and is more comprehensive and conforms more to modern requirements than the course given at any other Veterinary College in India. It is, therefore, particularly suitable for candidates from the whole of India who aspire to higher appointments.

¹ *Quirke*, 2 ; *P.A.R.*, 549-50.

It already supplies the requirements of northern India, and students have even come from as far as Mysore.¹

One of the most important duties of the Veterinary Department is the improvement of the breed of cattle by the provision on payment of stud bulls to District Boards or private persons, the latter often being encouraged to purchase by financial assistance from the District Boards. Unfortunately District Board finances are not always in a very flourishing state, while the demands made on them for objects which are popularly supposed to be more important than cattle breeding are steadily on the increase. Thus there is little to spare for the purchase of bulls; and what financial help is granted for the purpose is often obtained only after a very hard struggle. The allocation of District Board funds to the purchase of stud bulls finds increasing favour with the rural population; but the louder lung-power of the Education and Medical Departments has hitherto shouted down the reasoned arguments in favour of this necessary assistance to the work of the farmer.² The cattle and horse fairs held periodically by District Boards are also a very valuable agency for stimulating interest in breeding, facilitating the sale of young stock and bringing the officers of the Veterinary Department into contact with the rural population. They are also utilized for exhibitions of improved agricultural implements and produce, and they brighten the prevailing dullness of rural life by providing an annual district fête.³

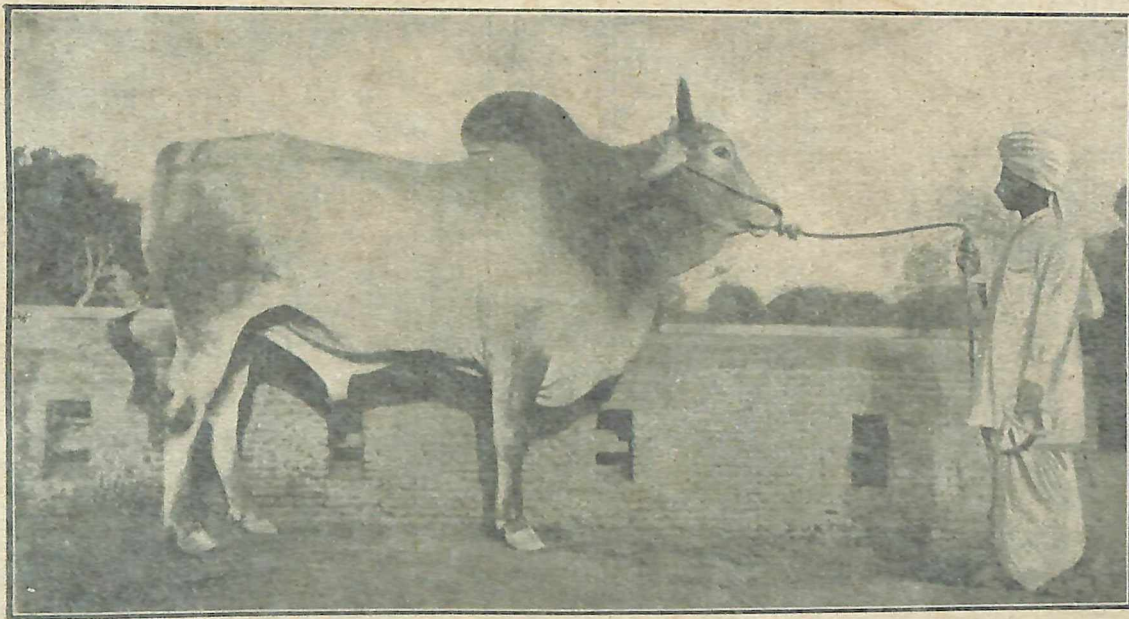
The supply of good bulls is mainly the concern of the Punjab Government Cattle Farm at Hissar, the premier cattle-breeding station in India. Its area of over 40,000 acres permits of good grazing for over 5,000 live-stock and at the same time allows for ten to twenty thousand maunds⁴ of good hay to be collected as a fodder reserve. An indication of the breeding operations carried

¹ *P.A.R.*, 552; *P.A.R.*, (1922-3) 163.

² *Quirke*, 3.

³ *L.A.M.*, 823.

⁴ about 400 to 700 tons (see Appendix XV.)



Typical Bull of a Milking Strain bred at the Hissar Cattle Farm.



on may be gathered from the fact that there are (on an average) 1,650 births on the farm each year ; and 250 stud bulls are available annually for distribution to District Boards. There were in 1923 over 1,700 Hissar bulls at stud in the Province as compared with 637 in 1914, all of them specially selected animals with known pedigrees, and the demand continues to increase. These bulls are being bred with the primary object of themselves begetting plough bullocks, fit to take their place in the agricultural development of the Province. That these are the best procurable and are suited to agricultural requirements is evident from their increasing popularity with the rural population. That their progeny is superior to the village type is evident to any one who has visited the villages where these District Board bulls are at work, or the fairs where their offspring are exhibited. It is a matter of general knowledge that the progeny of District Board bulls realizes far higher prices in the open market than the ordinary village breed. Financial considerations alone should, therefore, lead District Boards to invest more money in the encouragement of cattle-breeding, for by organizing cattle fairs on the lines followed in other countries they could recover their expenditure out of the increased revenue derived from the sale of these animals.¹

But the output of the Hissar Cattle Farm is limited ; while the demand for stud bulls may be expected to increase. To cope with this demand, farms in the Lower Bari Doab Colony have been granted² to private owners on the condition that they breed Hissar cattle. These farms are under the supervision of the Veterinary Department. They are stocked with Hissar bred animals, so that the breeding arrangements on these may be a duplicate of the breeding done on the Hissar Farm, making allowance for the differences of climate and environment. Unfortunately, however, there is a tendency on these grantee farms to reckon the breeding of cattle as a side line, to which only that amount of attention is devoted which is necessary

¹ Quirke, 2-3 ; P.A. R., 551 : A.C.M., 256.

² p. 278.



to prevent the confiscation of the farms. For so long as there still exist in the Province unirrigated cattle-breeding areas from which bullocks can be imported at less expense than it costs to rear them on irrigated land, cattle-breeding on a large scale can only exist in the Canal Colonies under the artificial conditions of these farms, and there is no incentive to the grantees to devote more attention to their cattle than the conditions of their leases make imperative. Two of these grants are conditional on dairy farms being set up for the supply of milk to Montgomery and Lahore cities. A pasteurising plant has been instituted in the Lahore grant. Milk records are now being maintained on all these farms and the grantees are beginning to appreciate the great value of these records when attempting to breed cattle which will give improved milk yields. ¹

The indigenous breeds of Punjab cattle are of the humped Indian type. Their suitability for Indian conditions of climate and feeding and their marked unsusceptibility to contagious disease render them a better basis for the evolution of good ploughing and milking strains when uncrossed with the English and Scotch strains, which some enthusiasts have imported in the attempt to unduly hasten the development of good milking qualities. ² Of all these the most celebrated is the Haryana breed, so called from Haryana, ³ the old name of the tract covered now by the Punjab districts of Hissar, Rohtak, and Gurgaon, together with the adjoining territory of the Phulkian States and the Rajputana States of Bikaner and Jaipur. From time immemorial this tract has produced a number of cattle greatly in excess of requirements and it must now be looked on as a store, from which are supplied many of those districts of the Punjab and the United Provinces, whence cattle-breeding has been completely pushed out by cultivation. This well-known fact is further substantiated by the returns

¹ *Quirke*, 4-5; *P.A.R.*, 554; *P.A.R.* (1923-4) 210-1; *A.C.M.*, 259-60.

² *Gazetteer*, 64; *A.C.M.*, 262.

³ *L.F.R.* 11, see Map. VI.



of stock sold at the seasonal fairs for which the tract is noted and by the recent cattle censuses of the Province. Every animal attending a Haryana fair is bred locally, and every Central Punjab district draws on Haryana for bullocks. A large majority of those recorded as sold in the tract itself find their way almost immediately into the hands of traders from other districts, or are taken by local dealers to Lyallpur to meet the demands of new cultivation in the colonies. The sales to districts of the United Provinces are scarcely less numerous.

Having regard to the admitted excellence of the Haryana breed the importance of this tract as a store-house of cattle for the rest of the Punjab cannot be over-estimated. The whole population of Haryana is vitally interested in the maintenance of this store and the matter is of no less importance to the districts drawing their supplies from this source. The physical features of Haryana constitute an ideal breeding ground. The climate is dry, and though at times extremely hot, is generally healthy ; and the dry sandy soil contains the lime essential to bone formation in young stock. Though the rainfall is scanty, only a few showers are required in the monsoon to produce a plentiful crop of excellent grasses both in the cultivated fields and on the sandy hillocks, which are a marked feature of the more arid tracts. In dry seasons the scarcity of fodder, inasmuch as it forces the animals to roam far in search of their needs, ensures a sufficiency of exercise, while the fodder itself, though deficient in quantity, is always rich in nitrogen. Situated, as the Hissar Farm is, in the centre of Haryana, it is the Haryana breed which forms the most essential element in its cattle.¹ Steps are also being taken to supplement the work of the Farm by judicious advances to village cattle-breeders for the purchase of stud bulls.²

The country lying between the Salt Range and the Sohan River³ is to the north-western districts of the Punjab what the Haryana tract is to the south. The climate is healthy and the cultivation depends

¹ *Dairying*, 7.

² *A.C.M.*, 263 ; *Quirke*, 6-8.

³ See Map VI.

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entirely on rainfall. There is little grazing in the true sense of the term, for excepting the rocky ridges and the ravines which intersect the country, every acre is under cultivation. But the people are good cattle masters, and take a pride in their animals, which they are careful to exercise so far as space is available. Communications are still poor, and this fact has tended to maintain the purity of the celebrated Dhanni ¹ breed of this area. ² Small but sturdy, its bullocks make excellent ploughers, and with the provision of fodder storage against the constantly recurring fodder famines of this area it should be possible to render this breed the mainstay of bullock power for the north-western Punjab. The small Dhanni bulls are also better than the large Haryana type for improving the strain of the diminutive hill ³ breed, whose small stature often saves them from slipping down the hill-sides, where a large bullock would go over. ⁴ The Montgomery ⁵ breed of milch cattle, once so famous in the jungles of the central Punjab, is now rapidly disappearing owing to the cultivation of its grazing areas consequent on the extension of canal irrigation and the export of the best milch cows to the towns. So parlous is now the state of the Montgomery breed, that it would probably be wiser to forego the sentiment attached to preserving its special qualities, and to aim rather at producing an efficient dairy animal, regardless of Montgomery characteristics. ⁶

The Montgomery is the exception which proves the rule. The dual-purpose cow and the plough bullock. not a good milker. It is kept for breeding plough bullocks and not for milk, which is generally obtained from she-buffaloes. This wasteful maintenance of two sets of animals, oxen and buffaloes, in a country which is periodically short of fodder, has oriented modern Veterinary endeavour in the direction of the dual-purpose

¹ Also known as Pothwar.

² *Dairying*, 8; *A.C.M.*, 262-3; *Quirke*, 6.

³ *Pahari*, prevalent in all the hill districts.

⁴ *Dairying*, 15.

⁵ or *sahiwal*.

⁶ *Quirke*, 7-10; *Dairying*, 16-18.

cow, which will both rear good plough bullocks and also supply enough milk for its owner and his family.¹

Still, however, the main object of Punjab cattle-breeding is the plough bullock, and if numbers alone were considered there would be little to fear. The average sown area for the last ten years² is 24 million acres, and it is necessary that the number of bullocks (and male buffaloes) should be maintained at the quantity necessary to plough this. The following figures illustrate the position :—

Year.	Bullocks and male buffaloes (millions).	Number per 100 acres (average area),	Ploughs (millions).	Ploughs per 100 acres.
1909 ..	4.9	20	2.2	9
1914 ..	5.1	21	2.3	10
1920 ..	4.8	20	2.2	9
1923 ..	5.0	21	2.3	10

Thus for every ten acres there is a yoke of bullocks and about one plough, which would on the face of it be more than ample. But an indefinite number of bullocks must be deducted as not really up to useful work. Moreover, the size of bullocks varies greatly, in the hills they are hardly larger than goats. The intensiveness of cultivation must also be taken into consideration. There is also a great deal of difference between the improved type of plough now being turned out under the auspices of the Agricultural Department and the old country plough³ which still prevails generally throughout the Province. Bullocks and male buffaloes are also used for transport purposes, and the 3 million carts in the Province require 6 million cattle to pull them. But such animals are generally used for ploughing also and need not

¹ *Brayne* 3, 62-3; *A. J. I.* (Nov. 1923) 604-7.

² This is taken rather than the area sown in particular years as the number of plough cattle must be maintained up to the average standard. It cannot oscillate with the sown areas of particular years.

³ p. 318.

therefore, be subtracted from the plough power of the Province. Camels are used for ploughing in some of the sandy tracts of the Province, but hardly in enough numbers to affect the figures. As far as numbers go, the plough power is, therefore, adequate.¹

An alternative to the dual-purpose cow is the dual-purpose buffalo. Wild buffaloes are no longer found in the Punjab, but the domesticated cow-buffalo is common and highly priced. Its popularity is greatest in the Canal Colonies. But it is to be found in all districts where grazing is limited, and the value of the land for other purposes is so great as to render its allocation to fodder purposes unprofitable. It stands the stall-feeding, which is unavoidable in highly cultivated areas, better than the cow. It produces far more milk in proportion to the fodder it consumes than does a cow.² Moreover, though insipid to English palates, buffalo milk is rich in fat from which are made large quantities of the Indian housewife's stand-by, clarified butter.³ It will also stand adulteration better than cow's milk, and this, unfortunately, gives it a better sale value. As a milk producer only, therefore, the cow buffalo is a better commercial proposition than the cow. But the defects of the male-buffalo as a plougher have hitherto militated against the dual-purpose buffalo in the minds of Veterinary experts. Though its use is increasing, it is still practically limited to those cultivators who cannot afford to purchase bullocks. The sluggish nature of the male buffalo, its inability to endure heat, and its desire for water, all render it extremely unsuitable to a hot dry climate like that of the Punjab. Against this, however, must be set the fact that it is docile, intelligent, and, if not feeling the heat, a steady worker. Possibly a hardier type might be evolved by importing bulls from the drier tracts and the present broad-minded Superintendent of the Veterinary Department⁴

¹ Punjab Cattle Census (1923) 5; *A.C.M.*, 264.

² An exceptionally good cow-buffalo will give about 50 lbs. per day. (*Gazetteer*, 64).

³ *ghi*.

⁴ Mr. Quirke, whose tact, energy, foresight and readiness to receive impressions from outside have done so much to raise the standard of Veterinary work in the Province.

regards the dual-purpose buffalo as within the range of practical possibilities. Hindu religious feelings are not aroused so strongly by the buffalo as by the ox, and consequently male buffaloes can be easier made away with than steers. Selective breeding of buffaloes is, therefore, easier for the religious cultivator, who can keep the best stock for breeding purposes, and eliminate the rest. The maintenance of a high standard amongst buffaloes without official help is, therefore, easier than is the case with oxen.¹

On the whole the rural milk supply is fairly satisfactory, Rural milk and the average yield *per annum* of good supply. Punjab milking breeds such as Hansi or Montgomery (2,500 lbs.)² and of south-east Punjab buffaloes (4,000 lbs.)³ compares favourably with that of the United Provinces breeds, Mewati (2,000 lbs.)⁴ Kherigorh (500 lbs.) and buffaloes (2,500 lbs.). But the corresponding yield of average English cattle (*e.g.*, Shorthorn 7,200 lbs.)⁴ gives food for thought. There is no doubt that cows and buffaloes in India give far less milk than is given by any cow whose existence would be tolerated in Europe. In Europe that cow is selected which will give the maximum amount of milk for a given amount of fodder. In India the cow is generally given the bare minimum of fodder which will preserve it from starvation.⁵ But in the Punjab, among the more enterprising peasantry of the Canal Colonies, the stupidity of this penny-wise-pound-foolish policy is becoming evident, and the large udders of good milch cows are becoming increasingly evident in the houses of Mr. Quirke's⁶ disciples.

Very different is the case of the towns, whose growing Urban milk size throws an increasing strain on the primitive systems of milk supply in vogue. Their milk is mainly provided by cowherds,⁷ who maintain their

¹ Punjab Cattle Census (1923) 8-9; *Gazetteer*, 64; *Dairying*, 15, 19.

² *i.e.*, an average of 7 lbs. (3½ seers) daily throughout the year.

³ *i.e.*, a daily average of 11 lbs. (5½ seers).

⁴ 20 lbs. (10 seers daily).

⁵ Punjab Cattle Census (1923) 10.

⁶ Superintendent of the Veterinary Department (see p. 366).
gwala.

herds within the town precincts, where they purchase fodder for their maintenance, or drive them to the nearest grazing grounds, often causing damage to the land through which they pass. They are generally in debt to the local money-lender,¹ and consequently are not in a position to feed their cattle well,² as they are allowed to retain only just so much of the proceeds from the sale of milk as will suffice to keep themselves and the cattle alive, the money-lender appropriating the rest. In large cities like Lahore and Amritsar, the system breaks down completely. Fodder has to be purchased at prices enhanced, not only by the cost of transport and storage, but often by the artificial addition of octroi. The underfed cattle are housed under the most insanitary conditions, and are milked by cowherds who have no conception of personal or instrumental cleanliness. An open mouthed brass receptacle plugged with grass or straw serves the purposes of a milk-pail. Carried in an open cart or on a pack-saddle, contaminated with dust and dirt, and adulterated and sophisticated according to the whim of the various vendors, the fluid which finally reaches the consumer rather resembles a bacteriological menagerie than milk fit for human consumption. The limited supply of even this unappetising wash is, for the most part, commandeered by the richer inhabitants, leaving the children of the poor to pine away without a necessary article of diet.³

These wealthy members of the community are only slightly interested in the problem of milk supply. They either keep cows in their houses or have special arrangements with the peasantry of a village outside the city.⁴ And even improved sanitation will effect nothing without a very great increase in the quantity of milk generally available. Neither multiplicity of laws, nor armies of inspectors will, in the long run, produce a pure and sanitary supply of milk for a city if the quantity available is seriously inadequate. Moreover, as Indians

¹ *bania*.

² Punjab Cattle Census (1923) 11.

³ *B. E. E.*, 2 (Preface); Punjab Cattle Census (1923) 12.

⁴ *Dairying*, 37.



consume milk in a cooked form, the insanitary conditions surrounding its production are much less dangerous to them than to Europeans. And insistence on a high standard of purity would only raise prices, as long as the supply is limited. Before the question of sanitation can be tackled, it is therefore necessary to secure an adequate supply.¹ Organisation of transport will alone solve this problem, and the margin between the price in the villages within transportable distance and the price in the city would then amply cover the cost of carriage.² There is no reason why milk from the fodder areas should not be pasteurised and sent into the big cities in refrigerating vans in a "milk train," or in refrigerating motor vans on the road. The problem is how to treat milk so that it will keep in good condition long enough to enable farmers to send it over considerable distances into the towns. This problem is being tackled through the installation of a milk pasteurising plant at the Agricultural College³ dairy, where instruction is being given to students as to the proper methods of milk preservation. Its solution should also provide the Punjab peasant with dairying as a valuable side industry, supplementary to crop growing. One of the weak points of Indian, as compared with European, agriculture is the lack of side industries to fill up the spare time of the agriculturist.⁴

In rural districts there is little trade in pure cow or Clarified but-ter (ghi). buffalo milk. What is not required for home consumption is converted into clarified butter,⁵ that housewife's cooking essential which takes the place occupied by lard in England. The manufacture of clarified butter is the principal home industry of the Province, but owing to the lack of co-operative methods the producer fails to receive his appropriate share of the profits. The wholesale

¹ *A.J.I.* (Sept. 1922) 496.

² Milk will often be selling at 3 to 4 seers to the rupee in the city, when a few miles outside it will fetch from 8 to 12 seers only.

³ p. 322.

⁴ Punjab Cattle Census (1923) 13; *A. J. I.* (Sept. 1922) 497-500; *P.A.R.*, (1923-4) 192.

⁵ ghi.

supply trade is in the hands of traders, chiefly of the money-lending¹ class, who reside at convenient centres on the railway, whither the clarified butter is brought by the smaller village traders, who buy it up in the villages from the peasant producers. These latter are sometimes paid in cash but more often by credit in the money-lender's running account, which is balanced (if at all) at irregular intervals and rarely in favour of the peasant. The pressure on the milk supply has raised the price of clarified butter, which tends more and more to become adulterated with nauseous animal fats. A regular trade in such compositions is carried on from certain stations in the neighbourhood of Delhi, the bulk of the supply being exported to Bengal.²

The large and increasing demand for milk and clarified butter could easily be met from the villages, Dairying. if business methods were applied to the production and sale of milk products. If transport facilities were provided there would be a ready market for milk produced in villages, where fodder crops can be readily grown; and thus a means would be provided of converting fodder into a saleable and marketable commodity. The area of fodder crops would then rapidly extend to meet the demand. The introduction of fodder crop cultivation into village agricultural practice does not necessarily mean that land will be diverted from food crop production for the purpose. The land lying immediately round villages is capable of giving very heavy yields of fodder, often at periods when it would otherwise be lying out of cultivation; and very small areas of such land are required to yield the necessary supply. The mixed farming thereby resulting would do much to give stability to an agriculture which is now too dependent on the changes and chances of crop production. Transport organisation, combined with co-operative finance, would emancipate the peasant milk-producer from the thralldom of the money-lender, and give him an adequate inducement to improve his methods of production by necessary expenditure on the sanitary buildings, churns and sterilising plant which are

¹ *bania*.

² *Dairyng*, 37-9.

essential for the handling of dairy produce.¹ The development of village dairying would stop the drain of the best bullock-bearing and milk-giving cows to the towns, where they are brought up to the wealthy city merchants to provide milk for their own private consumption, leaving only the worst behind in the villages to carry on the race.² This would also emphasise the importance of the bull, for, strange as it may appear, the apparently feminine characteristic of milking capacity is largely inherited through the male parent.³ The keeping of milk records would enable such bulls only to be used as were born from cows of a high milk-yielding capacity.⁴

The fodder question is greatly aggravated by the fact that there are large numbers of cattle which are mainly fodder consumers, and do not pay their way either as ploughers, milk producers, or breeders. And during a fodder shortage, unless man intervenes, that animal tends to survive which has merely to live, as against the one which has to live and do something else, produce milk, or plough. So that unless the situation is controlled, there tends to be a survival of those which are least fit for the purposes of man. And not only do the unproductive survive, but the productive themselves tend to survive when they have ceased to pay their way. From birth onwards an animal passes through an unproductive stage and its owner should only retain it for its potential value when it reaches maturity. In any calculation of the efficiency of the animal the cost of maintenance during this period has to be added to the cost of maintenance during its productive life. Later in life, it again gradually becomes unproductive, and unless disposed of, the cost of maintenance must also be debited against the profits of the productive period.⁵

¹ *Agricultural Practice*, 246 : *A.J.I.* (Jan. 1927) 33.

² *Punjab Cattle Census* (1923) 13.

³ *Agricultural Practice*, 197.

⁴ *A.C.M.*, 267.

⁵ *Punjab Cattle Census* (1923) 18. See also Appendix XXIII for a graphic treatment of the subject.



The Hariana¹ tract is largely Hindu, but the peasants are shrewd agriculturists and rapidly dispose of inefficient stock to the Muhammadan butchers² of Panipat, Sonapat or Rohtak "asking no questions for conscience sake;" so that the hide trade flourishes most in the area most celebrated for its breed of cattle. Before the development of the foreign export trades in hides the skins of dead cattle were considered to belong by right to the menial castes of cobblers³ and tanners,⁴ who in return were bound to provide the cultivators with shoes and the small leather articles used in husbandry without further payment. The rise in the price of hides owing to the growing demand for export has modified this custom of the early village community; and there is a growing tendency for the agriculturists to sell the hides of their dead cattle to cobblers and tanners at the market rate (if at all), and failing that to dispose of them to exporters. The export trade was originally in the hands of Muhammadan traders,⁵ but its profits have now induced European firms⁶ also to embark in the business, whose agents collect the hides at convenient railway centres.⁷ The religious prejudices of Hindus have hitherto actuated to prevent the trade in beef, which in other countries, Australia for example, supplements the trade in hides.⁸ Nor does the trade in bones yet bring any profit to the agriculturist, who still leaves them to the sweeper⁹ caste, who collect and stack them at convenient centres, where they are bought by travelling agents for the export trade.¹⁰

The utility of cattle is not confined to ploughing and milk production. There are 300,000 bullock carts¹¹ in the Province, a number which is steadily increasing with the tendency to abandon pack

¹ p. 352.

³ *Mochi*.

⁵ *Qasais* and *Khojas*.

⁷ *Dairying*, 45.

⁸ Though it is advocated by a Hindu Professor Praphulla Chandra Basu of Indore (*I. E. A.*, 6 (158)).

⁹ *Chuhra*.

² *Qasai*.

⁴ *Chumar*.

⁶ e.g., Ralli Brothers.

¹⁰ *Dairying*, 45.

¹¹ *bail-gari*.



animals for wheeled transport, as roads increase in number and improve in quality. They are characteristic of the fairly prosperous smallholder, and it is in districts like Rohtak and Ferozepore where this type predominates, that the largest number of carts is to be found. The number is greatest in the south-east, where every substantial yeoman owns one, and diminishes towards the north-west, where it is generally the custom to hire them, if necessary. Where roads are bad, goods are packed on the 600,000 donkeys of the Province, while a quarter of a million camels form the only possible means of transport across the deserts of the south and west.¹

Horses. Till the recent introduction of the motor-car, the only practical way of getting through the country off the main routes was on horseback, the relatively small number of horses (350,000) compared to the 2 millions of Great Britain being explained by the fact that horses are not used for ploughing in the Punjab. Under British rule the old indigenous breeds² have been increasingly improved by the infusion of the English and Arab blood of thoroughbred stallions. The present arrangements for horse, mule, and donkey breeding are the outcome of the recommendations of the Horse and Mule Breeding Commission of 1901. This Commission found that, under the administration of these, Civil Veterinary Department funds were being wasted by attempts to improve the breeds of horses and mules in districts where no hope of success could be entertained, and that in some cases a type of horse was being evolved unsuitable for the needs of the Army, in whose interest primarily the funds were voted. As a result, the sphere of Government operations connected with horse, mule and donkey breeding was confined to thirteen selected districts³ in the western and central Punjab, its control being transferred to the Army Remount Department. Elsewhere, district board and private

¹ Punjab Cattle Census, 19.

² Of which the Baloch and Dhanni were the best.

³ Rawalpindi, Attock, Jhelum, Gujrat, Shahpur, Jhang, Lyallpur, Gujranwala, Lahore, Multan, Dera Ghazi Khan, Amritsar and Ferozepore.



horse-breeding remained under the control of the Civil Veterinary Department.¹

Much has happened since then, and if there is now wastefulness anywhere it is certainly not in the Civil Poultry-keeping.

Veterinary Department, whose sympathetic handling is even inducing the rural classes to overcome their prejudice against poultry-keeping—a prejudice based on the fact that hitherto fowls have only been kept by the despised menial. The possibilities of poultry in the Punjab are immense, they could be kept in large quantities with little extra expense and would afford a valuable side industry to the agriculturist.

Equally great are the possibilities of the (till recently) neglected fish industry of the Province. The Fisheries. potential value of the fisheries of the Punjab, with its great rivers, and its innumerable lesser waterways, lakes² and tanks, is second to none in the inland fresh water fisheries of the world. From time immemorial this vast resource of the country has been abused in every conceivable way. Poison, dynamite, diversion of water, nets with a mesh that would hold up a mosquito, are only some of the many engines of destruction that have taken toll from the Punjab waters for hundreds of years. The breeding season has yielded and still yields a rich harvest to the improvident fisherman and villager. The flood that brings all the carp into the fields and shallow water to spawn is the signal for villager to make the most of the opportunity while it lasts: and fish that have not spawned and countless millions of ova and fry are destroyed annually. That fish are as numerous in the Punjab rivers as they are speaks volumes for their fecundity. Had they been looked after fifty years ago they would now afford the cheapest food in the market, instead of being a luxury for the richer classes only.³

¹ *P.A.R.*, 480, 556-7; *Gazetteer*, 64-5.

² *Jhil*.

³ *P.A.R.* (1923-4), 216.



It was not till the creation of the Fisheries Department in 1912 that any attempt was made to check this waste. The aim of the Department was to increase the fish supply of the rivers, streams and tanks in the Province by preserving the present stock, giving them every facility to propagate their species, and adding to their numbers by artificial breeding. The first three years were spent in studying the habits of various kinds of indigenous fish and in acquiring knowledge of the local conditions of fishermen and the fish trade. From the data collected it became evident that some measures were necessary to save the fish from extinction. Fisheries Regulations were framed requiring the taking out of licenses at low fees for all fishing in Government waters, prohibiting the use of small meshed nets, and introducing a close time during the breeding season. Fish ladders were constructed by the weir at the head works of canals to enable the migratory species to run up to their spawning grounds. Rewards were also offered for the killing of crocodiles, cormorants, otters and other enemies of fish.

Unfortunately the Department had hardly time to get established before the parching blast of early Reforms economics withered its early promise, and restricted the necessary expenditure on research in a country where little was known of the habits and life-histories of fish. This penury had its good side however. Starved as it was, the Department had no funds to support the hierarchy of officials characteristic of other Departments. It was forced to work through the natural leaders of the professional fishing castes, with the electrifying result that they rallied to its support, and provided it with a free administrative staff, whose voluntary enthusiasm was far more useful to the Department and far less oppressive to the people than the self-seeking service of the lower grade hirelings of the Police and Forest Departments. Thus supported, the Fisheries Department was enabled to check the activities of predatory outsiders, who were not interested in the future, so long as their baskets were well-filled with fish for the time



being. The Department abolished the monopolies of contractors who excluded fishermen from the exercise of their hereditary profession. The middlemen, who used to market the catch of fishermen on commission, were, however, encouraged, and induced to open shops or markets in big towns where there is a constant and regular demand for fish. The splendid work done by the Fisheries Department with its very limited means should suffice to prove how easy to lead and how difficult to drive—is the rural population of the Punjab.¹

4. FORESTS.

The potential value of the Punjab's forest resources is only just beginning to be realised. It lends a wide range of practical value to the interesting study of the Punjab flora. The flora of a province whose altitude ranges from a few hundred feet above sea level to a height 10,000 feet above the level of flowering plants. Now the nature of the vegetation of any tract depends primarily on rainfall and temperature and only secondarily on soil. In the deserts of the south and west Punjab, where both the air and the soil substratum are dry, where the sun is always shining and the heat is often unbearable, only specialised drought-resisting² plants can survive. Against this drought the devices of nature are many. To tap the subsoil moisture the plant roots may be greatly developed; to check rapid evaporation the leaves may be reduced in size, covered with silky or felted hairs, or converted into thorns, or their internal tissue may be succulent or mucilaginous. In the plants of the Punjab plains there is no difficulty in recognising these features. In the submontane zones, however, a more copious rainfall renders possible the richer sub-tropical flora of the dense jungly forests, which characterise these regions wherever the destructive hand of man has not desolated the hill-sides. Further up the Himalayas the air becomes steadily rarer.

¹ *P.A.R.*, 558-60; *P.A.R.* (1923-4), 215-17.

² xerophilous.



and therefore colder, especially at night; and at the higher levels in the Alpine region¹ there is again a marked reduction in the rainfall. Here fresh types of drought-resisting adaptations appear in the form of bigger roots, shorter stems, smaller leaves, and often larger and more brilliantly coloured flowers.²

The affinities of the flora of the Punjab plains, south of the Salt Range and the submontane tract, are Flora of the Punjab plains. with the desert areas of Persia, Arabia and North Africa. This is especially the case in the west, except in so far as the spread of canal irrigation has modified the type of vegetation. Irrigation apart, the soil and climate are unsuited to the growth of large trees, and a scrub jungle of a drought-resisting type at one time covered very large areas from the Jumna to the Jhelum.

The largest of the truly indigenous trees of the Punjab are the tamarisk³ and the thorny *kikar*, with its small golden flowers in wide spreading branches. The wood of the *kikar* is tough and close grained and very durable if water-seasoned. It is the Punjab peasant's stand-by for the spokes and felloes of his cart-wheels, and for sugar rollers, rice pounders and agricultural implements; and it needs little moisture and grows well in sour soils. The scrub jungle consists mostly of *jal*, *jand*, a near relation of the acacias, and the coral-flowered leafless caper. All these shew their desert affinities, the *jand* by its long root and its thorns, the *jal* by its small leathery leaves, and the leafless caper by the fact that it has managed to dispense with leaves altogether. The *jand* is a useful little tree, growing wherever the natural qualities of the soil are good. The sweetish fruit⁴ of the *jal* is liked by the peasantry, who in famines will even eat the berries of the leafless caper.

In the sandier tracts the *ak* grows abundantly everywhere. Its white stem and large broadly ovate leaves, which are covered with a white woolly substance on the

¹ Over (say) 11,000 feet above sea level.

² *P.A.R.*, 561; *Newbiggin* 113-117; *Dowie* 71-3; *Smythies* 1-3.

³ For the scientific and other names of the various trees see Appendix

⁴ Known as *pilu*.

under surface, render it conspicuous among the other vegetation, and as it contains a white milky latex of a poisonous character, it is left severely alone by cattle. Another noxious weed, the American yellow poppy, has also unfortunately established itself widely in the Punjab plains. More useful is the colocynth gourd, which, owing to the size of its roots flourishes abundantly in the Indian (as in the African) deserts.¹ On, and to the north of the Salt Range, the flora is of a distinctly Mediterranean type, and poppies are as familiar in Rawalpindi as they are in England or in Italy. The oil-seed *taramira*,² which sows itself freely on waste land and may be found growing even on railway tracks in the Rawalpindi division, is an Italian and Spanish weed.³

In the flora of the sub-montane region there is a strong infusion of Indo-Malayan elements. An interesting member is the Flame of the Forest, a small crooked-growing tree, which ushers in the hot weather with handsome clusters of flame-coloured flowers. It ranges from Ceylon round to Bengal, where Plassey and Decca both take their names from two of its vernacular names.⁴ From Bengal it extends along the south of the Himalayas all the way to the Frontier, through a submontane tract which was once one long forest of these trees. It coppices very freely, furnishes excellent firewood, and exudes a valuable gum, while its timber is used for the wooden frames on which the masonry cylinders of wells are reared, its lovely orange-red flowers yield a beautiful dye, and its dry leaves form a useful fodder for buffaloes in times of scarcity. A tree commonly planted near wells and villages in the submontane tract is the Persian lilac, so called because it is found as far west as Persia. The *bahera*, a much larger tree is Indo-Malayan, while the curious cactus like *Euphorbia Royleana* grows abundantly and is used for making hedges.⁵

¹ P.A.R., 562 ; Buck 123-4.

² *eruca sativa* p. 341.

³ P.A.R., 563.

⁴ *dhak, palas*.

⁵ P.A.R., 565.

Nearer the Himalayas lie the low hill ranges of the Siwaliks, where the climate is moister and less subject to extremes of heat and cold than nearer the plains. Indo-Malayan types are still more conspicuous, a noticeable feature being the large number of flowering trees and shrubs, such as the beautiful silk-cotton tree. Other trees to be noticed are the wild pear, the olive, several species of fig, the *tun*, whose wood is often used for furniture, and the *dhaman*, a medium-sized tree with a straight short trunk, whose wood is hard, elastic and tough and is used for oars, handles, bows, and poles, while from the bark ropes are made, the uncovered stems being kept in bundles and used as torches. Even the leaves are serviceable and make good fodder. The most valuable products, however, of the forests of the lower hills are the *chil* pine and the bamboo, which is really a giant grass often growing to a height of forty feet. Lances and spears are made from its stems, which also make excellent quarter staves for use in village brawls, while the pacifist can devote them to the gentler purpose of roofing, wattling and basket work, using the leaves as fodder. The *chil* pine gives a rough, coarse and not too durable timber. It is, however, cheap and easy to work, and so is much used in the hills for building houses and making boxes. The bark is used for tanning and as fuel for iron smelting, while the wood is often made into charcoal. Its greatest commercial possibilities, however, lie in its resin. For from this tar can be extracted, from which turpentine may be distilled.¹

The richest part of the temperate Himalayan flora lies between 7,500 and 10,000 feet above sea level. Above 10,000 feet sub-alpine conditions begin and at 12,000 feet tree growth becomes very scanty and the flora is distinctly alpine. Between 5,500 and 6,500 feet abounds the *ban* oak, so common at Simla, and distinguished by the grey colour of its leaves underneath. At 6,500 feet the *chil* pine stops and is succeeded by the blue pine, second only to the *deodar* in commercial importance.

¹ P.A.R., 566.

THE GIFTS OF NATURE.

Though often mixed with the *deodar*, it grows pure over large areas, and is spreading rapidly as the result of systematic protection from forest fires, so that the blank areas and bare hill-sides of fifteen and twenty years ago are now covered with dense crops of rapidly growing saplings. Its value is being increasingly appreciated in the timber trade. Next to worthless in 1895 it now fetches two-thirds the price of the *deodar*, whose oiliness renders it less suitable for furniture and interior work such as planking. But the *deodar* is more durable, and is invaluable for *deodar* railway sleepers which last twelve years on the average. From the wood an oil is extracted by destructive distillation, which is used for preserving the inflated skins on which the primitive peasant crosses the Punjab rivers. In the same zone (between 7,000 and 9,000 feet) is to be found the glossy-leaved mohru oak, whose wood is used for making charcoal, and the beautiful rhododendron, a small tree of the Heath order, which in April and May lights up the sombre Simla forests with its bright red flowers. Higher up, the enormous Himalayan spruce with its grey tassels, and *Abies Pindrow* with dark green yew-like foliage, succeed the blue pine. These splendid trees are, however, unfortunately of small commercial value.¹

In the hills the historic claim of the State to the waste Deforestation. was much stronger than in the plains, and the village communities were only artificial creations of the British Settlement Officer²; yet many of these valuable forests were divided up amongst them, the State merely retaining its rights over certain kinds of tree. This arrangement worked well as long as the scanty population only needed a reasonable amount of grazing and fodder and firewood for home consumption. But with the increase of population and the development of communications in the outlying hills, the inhabitants soon discovered that the trees had a sale value as timber and firewood, and for charcoal burning, and that the rights of the State to restrict wholesale

¹ P.A.R., 567; Buck, 125-31; Smythies, 26, 28.

² p. 13.



deforestation were ill-defined. Deforestation of this type is typical of man in all ages and in all countries, and it is only quite recently that its essential wastefulness and its ruinous effect on the climate have been properly appreciated. Thus was the happy land of Arabia Felix reduced to a desert,¹ thus have large, once fertile, parts of Italy, and Spain, been reduced to barren rock,² thus in Palestine has the far famed Forest of Sharon disappeared.³

So the earlier forest history of the Punjab is one of bounteous natural resources wasted by man. The evidence of early civilization in the now barren frontier hills and the sandy wastes of Hissar indicate a vegetation which has now disappeared.⁴ The advent of British rule coincided with the deforestation of the Siwaliks, the sub-tropical verdure of the submontane region disappearing to leave only barren rocks, whence flowed forth not fertilising streams, but destructive torrents, laden with sand and washing away fields and even portions of the Grand Trunk Road. Since then the work of denudation has gone steadily on, and it is only recently that steps have been taken to check it.

The chief agency in this work of destruction is the goat. Goats and sheep. Once the pioneer woodman has felled the big trees of the forest, an army of goats comes in to render the devastation complete. For goats love new saplings and no ordinary tree therefore has a chance of survival. Only shrubs with some disagreeable quality, hairs, spines, resin or a strong aromatic flavour, can hope to survive against the catholic tastes of the all-destroyer. Such is the *sanattha*,⁵ which survives in the barren Salt Range and Siwaliks, where all other shrubs have been devoured. It is often claimed as a virtue of the goat that he can "eat a class of fodder which

¹ Wells, 113.

² Newbigin, 122, 137; E. J. (Hist.) Jan. 1928 (370).

³ Holy Land 80, 147-8.

The prohibition in Deuteronomy against cutting down trees in time of war (xx 19) shews that the dangers of deforestation were realised even in early times. The cult of sacred trees was probably inspired by the same underlying idea.

⁴ P.A.R., 570.

⁵ *Dedonaea viscosa*.

cows or even sheep will not touch.”¹ Doubtless he will, but not till he has cleared the country of everything better.

It is the green-eyed monster, which doth mock
The meat it feeds on.

Having rendered the country impossible for every other living thing, he finally renders it impossible for himself. The goat army, like its Bolshevik counterpart, must then look for fresh worlds to devastate or must perish. The merits of the goat are, in fact, not so much economic as political. It is the poor man's cow (giving milk and meat, the hair being also woven into ropes, sacks and mats), the poor man's instrument of revenge on all engrossing landlords and money-lenders. Its elimination would, no doubt, restore prosperity to thousands of barren acres, but the fruits of that prosperity would be reaped, not by the owners of the goats, but by self-seeking rent-receivers. Marching under the Bolshevik banner, the army of goats has, therefore, been invincible. The statesman who will oppose its progress must, therefore, compensate the dispossessed proletariat of goat-owners, or he will incur certain obloquy in the present, in return for the very doubtful blessings of posterity.² The number of goats varies with the provender available. In 1904 it reached 5½ million, while in the scarcity year of 1920 it fell to 3 million, increasing again to 4½ million in 1923.

The number of sheep remains constant at about 4½ million, as against the 29½ million of Great Britain. Sheep are important in the south-west Punjab, where wool is a staple product. The fat-tailed sheep,³ which lives on its tail during periods of scarcity, is found in the Salt Range, but does not flourish in the more fertile regions east of it. In the Himalayas is a variety resembling that of Dartmoor or Exmoor. The sheep is a less destructive animal than the goat, as it leaves trees alone, and confines itself to legitimate grazing, but expert opinion is against encouraging the increase even of sheep in any areas where deforestation has become

¹ B. E. E., (2) 2.

² B. E. E., (2) 2; Newbiggin, 130; P. A. R., 566.

³ dumba.



a problem. The introduction of Merino rams should help to improve the breed. But with the hills barred, and the grazing grounds on the plains growing more restricted with the spread of cultivation, it does not seem wise to encourage the increase in numbers of even sheep, though an improvement in quality is eminently desirable.¹

The work of devastation begun by the goat is completed by the camel, which can survive where even the Camels. goat must perish. It is hardly an exaggeration to say that the goat and camel between them are responsible for the Sahara and the deserts of Arabia, Mongolia and Rajputana, deserts which have steadily encroached on the cultivation round them during historic times. Like the goat the camel has the doubtful merit that it can survive in deserts where life is impossible for other animals, while in more fertile lands its owner can keep it at little cost by allowing it to browse on way-side or canal-side trees. If the goat is the poor man's cow, the camel is the poor man's car, and it is still the only possible means of transport in the desert. Camels² are subject to *surra*, a deadly disease caused by a tiny parasite,³ which lives in the camel's blood, and is carried from one camel to another mainly by blood-sucking gadflies.⁴ These gad-flies lay their eggs on the leaves of aquatic plants and trees and on rocks overhanging water, and from this it is inferred that one way to protect camels from *surra* is to keep them away from tracts which are low-lying and swampy or bordering on canals and rivers. The discovery of this method of prevention and the equally valuable Tartar Emetic cure are a striking tribute to the value of research in Veterinary, as in other economic fields, a value which is not always sufficiently appreciated by cheeseparing politicians.⁵

¹ Punjab Cattle Census (1923) 20. *P.A.R.*, 480, 554; *Gazetteer*, 65.

² There are $\frac{1}{4}$ million camels in the Punjab.

³ *trypanosome*.

⁴ *tabanidae*.

⁵ Punjab Cattle Census (1923) 19; *P.A.R.*, (1923-4) 213-4.

THE GIFTS OF NATURE.

The protection of the hill forests from the devastation of goat and camel is, therefore, vital to the interests not only of the timber supply, but also of the agriculture of the Province, and the bare enforcement of forest rules, which sufficed when the population was small, and the people more simple, is no longer adequate. Pastoral pursuits need to be restricted until the people have learnt to breed better stock, to grow better crops, to cut hay instead of grass and to stall-feed where pasture is insufficient. Apart from this the management of hill forests needs the closest expert control with a view to the supply of timber not only in the demarcated areas managed by the Forest Department, but where the Chiefs of Native States or the villages have hitherto had more or less a free hand. Even in England the landowner is no longer inclined to plant trees for the benefit of posterity¹ and the less far-sighted Indian is even more bounded by the horizon of the immediate present. In the Punjab an Act² has been passed to prevent the erosion by hill torrents of certain submontane areas, and spasmodic efforts at re-afforestation have been made by a few energetic Deputy Commissioners³ in their own districts. But political considerations have so far prevented the problem from receiving the serious attention which it deserves.⁴

The Forest Department. The administration of all the more important forests is controlled by the Forest Department, which is organised in three Circles, Eastern, Western and Utilization; the first two geographical and the latter dealing with the commercial exploitation of the Forests. All the three Circles are controlled by the Chief Conservator, who is the Head of the Forest Department in

¹ Venn, 344.

² The Chos Act. *Cho*—a torrent bed full of sand (in the dry season).

³ In particular Mr. Brayne, the Deputy Commissioner of Gurgaon, of Rural Uplift fame. *Brayne*, 50-2.

⁴ *P.A.R.* (1924-5) 55, 237.

the Punjab. The distribution of the Forest areas of the Province is shewn in the appended statement:—

FOREST AREAS, 1924 (*Thousand Acres*).

	Reserv- ed.	Protect- ed.	Unclas- sed.	Leased.	Village forest lands.	Total.
Under Forest De- partment ..	8,30	25,84	3,23	2,28	..	39,66
Under Civil and Military control	3,20	2,41	10,50	..	1,77	17,88

It will be seen that about one-third of the forest area is under the control of the Civil and Military authorities, the remainder being under the direct management of the Forest Department. The area is further classified into "reserved" and "protected" forests, the majority of the remainder being recorded as "unclassified." Reserved forests may be of two kinds. They may be situated on hill slopes, where the preservation of such vegetation as exists, or the encouragement of further growth, is essential to protect the cultivated plains that lie below from the devastating action of hill torrents. Here the interests to be protected are important beyond all comparison with the interests which it may be necessary to restrict; and so long as there is a reasonable hope of the restriction being effectual, lesser interests must not be allowed to stand in the way. Reserved forests also include the great tracts from which the supply of the more valuable timbers—*deodar* and the like—is obtained. They are for the most part (though not always) essentially forest tracts and encumbered by very limited rights of user; and when this is the case, they should be managed mainly on commercial lines as valuable properties of, and sources of revenue to the State. In such forests a regular settlement¹ is entered into which prevents new rights accruing to the public.

¹ p. 181.

In the case of "protected" forests Government control is exercised more particularly in the interests of the right-holder. Many of these forests produce only the inferior sorts of timber or smaller growths of the better sorts. The first object to be aimed at is the preservation of the wood and grass from destruction, for user must not be exercised so as to annihilate its object, and the people must be protected against their own improvidence. The second object should be to supply the produce of the forests to the greatest advantage and convenience of the people. To these two objects all considerations of revenue should ordinarily be subordinated. Protected forests also include many which are in reality pastures or grazing grounds, and are forests only in name. "Unclassed" forests have not yet been placed in either of these categories.

The first duty of the Forest Department is the regeneration and conservation of these valuable forests ;
 Commercial exploitation. next comes their utilization and exploitation.
 At the present time the Punjab is only making commercial use of about ten per cent. of the value of the annual product of her forests. The amount of timber grown annually would permit her to become a large exporter of lumber with resulting benefit to her commercial position. There is a real world demand for dependable supplies of all sorts of wood products at good prices. The Punjab imports Swedish pine, box shooks, boxes and general structural lumber. Her railways are bringing in treated fir sleepers for experimental use from British Columbia and the United States, while she has forests of her own rotting within forty miles of railhead. Mechanical transport in the form of ships brings forest material nearly nine thousand miles. A comparatively small amount of capital invested in transport schemes would drive all foreign timber off the Punjab market, undersell it in Australia, Mesopotamia, and Egypt, and place the valuable woods of Kangra and the Simla hills on the London market at a satisfactory profit. The transport required includes the extension of railways, the improvement of waterways for timber floatings, the construction of slides



and flumes, the organisation and installation of mechanical road transport, the cheapening of dragging methods and the mechanical haulage of logs to a central point, whence they may be sent on to depôts by some of the above-mentioned methods of transport.

In the hills afforestation is vital to the preservation of the countryside both there and in the plains below ; in the plains it is vital in the interests of the fuel supply. Unfortunately at the time of the annexation of the Punjab *laissez-faire* theories prevailed,¹ and the then tendency of the British administration was to withdraw from all interference wherever possible. This particularly, applied to the eastern Punjab, where the villages lay close together, and which was annexed before the advantage of keeping a part of the soil of the country in its natural state was fully understood. Even the low hills south of Delhi were included in village boundaries, and remained desolate and barren, though under Government supervision they might easily have been re-clothed with forests of the beautiful and valuable Flame of the Forest.² Unfortunately few fuel or fodder reserves were left in the eastern Punjab and in the central districts the same policy was followed though less completely.

But by the time the question arose in the western Punjab experience had shown the impolicy of these wholesale renunciations, and after allowing each village an ample, sometimes indeed an excessively large, area of grazing land, the remainder was claimed as Government waste. These areas were in some cases utilized as fuel reserves under the Forest Department, but their main value to Government arose on the introduction of Canal irrigation, Government being thereby saved the difficulties arising from the compensation due to previous owners. The acacia and the *shisham*, the latter a tree requiring more moisture than the acacia—its natural habitat being the riverbeds and ravines of the submontane area, are both necessary to the peasantry for carts and agricultural implements, but it was

¹ See *L.F.R.*, 287-8.

² p. 378.

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with a view to increasing the fuel supply that the attention of the Government was first directed to afforestation in the plains. Increased cultivation had led to a rapid diminution of waste areas and a still more rapid deforestation of those that remained, and the inadequacy of the fuel supply had strengthened the wasteful habit of burning the cow dung which should have been preserved to manure the fields.

As a compensation for the loss of natural forest, about 80 square miles of irrigable land has been taken up for forest plantations and a further 50 square miles are shortly to be allotted. These irrigated plantations cannot replace, in all respects, the much larger areas of natural forest which have disappeared; but the much more rapid and dense growth of trees under irrigation may replace past supplies of firewood and timber, and in times of real scarcity the plantations will supplement the fodder supply. The size of such plantations is limited to the area which can be successfully irrigated during April, May and June, when, if flooding is not carried out, failure is certain. It is, however, a recognised principle of irrigation that field cultivation has a prior claim to the available water supplies so that plantations do not always receive as much water as they need.

The preliminary work of laying out an irrigated plantation is carried out by the Irrigation Department, which constructs the distributary water channels. The soil excavated from the small irrigation trenches is thrown up in the form of a ridge running alongside, *shisham* and mulberry seed is sown on this ridge, and the trenches are filled with water several times during the dry period from April to June. As the plantation becomes older less water is required, but if irrigation is suspended altogether, the trees invariably die off. In view of the capital invested, or rather accumulated, in these plantations, and their ever increasing importance in the fuel economy of the Punjab, it is essential that their minimum water requirements should be guaranteed; but hitherto the tendency has been to starve plantations in time of shortage. A particularly valuable plantation at Kot Lakhpat, six miles from Lahore, which was just coming



into full bearing and would have proved a valuable reserve of fuel supply for Lahore, was nevertheless sold at a nominal price to the promoters of a Garden City scheme. The sale was typical of the pandering to politicians of the early Reforms epoch, as there were plenty of other sites¹ near Lahore better suited for a Garden City; but these would have had to be purchased at market rates, nor would the purchasing politicians then have reaped the golden rewards they got from the sale of the Kot Lakhpat trees, saplings though they were.²

Arboriculture is a special branch of forestry. Its main interest for the Punjab is in connection with roadside trees planted and conserved by the District Boards, (and to a less extent by municipalities). Yet something has been done by means of lenient assessments³ to encourage private individuals to plant gardens and orchards, and in the Canal Colonies settlers have been always encouraged and sometimes coerced to plant trees on their own lands or by the side of roads.⁴ But much more might be done. Outside each village is a waste patch of common land, where buffaloes are tied, and cow-dung cakes stored, and where children incontinently ease themselves. A little thoughtful combination on the part of the villagers might easily transform this disease-trap, redolent of dust and dirt, into a shady meeting-place and an adequate fuel-reserve for the whole village. This, however, postulates the revival in the village community of that corporate spirit which the English legal system has destroyed; it also postulates encouragement from Government officials, who must cease to be politicians, and once again become philanthropists.

Roadside arboriculture commenced when the Board of Administration,⁵ shortly after annexation, planted nearly a million trees in two districts alone. Since then the work has proceeded steadily with an

¹ e.g., Shahdara.

² A.C.M., 186; Smythies, 19-20; P.A.R., (1923-4) 236.

³ S.M., 510.

⁴ C. M., 490.

5 p. 11.

energy dependent on the individual initiative of the Deputy Commissioners¹ concerned, there being no special Department to deal with the matter. Such roadside trees are planted primarily for shade ; but arboriculture is becoming a source of income in submontane districts like Sialkot or Ambala, and to a less degree in Canal Colonies such as Lyallpur, where young trees require far less supervision than in drier districts, and where consequently there has now accumulated a reserve of roadside trees, ripe for felling. Care, however, is (or should be) taken to replace and more than replace, all cut trees. In order to provide trees in the inhospitable land of the Lower Bari Doab Colony,² over 12,000 acres have been distributed in tree-planting grants, and it is hoped that in this way the colony may be provided with well-stocked avenues without the usual initial expenditure.³

The first essential to successful arboriculture is the proper selection of the trees to be grown. This must be based on a study of local conditions, the facilities for, or absence of, irrigation, the results of previous operations, and observations as to what trees will naturally thrive in the district. The *tun* and mango, for instance, will grow to perfection without irrigation in some of the submontane districts enjoying a heavy rainfall and a well-drained soil. They would necessarily fail without irrigation in dry districts. Where it can be grown, the mango is one of the most useful and beautiful trees for avenues and plantations. A large handsome evergreen, it gives ample shade, and has the additional advantage of bearing a valuable fruit. *Shisham* trees often die off owing to the presence of a *kankar* bed beneath the surface, whereas they attain their maximum size on sandy soils subject to percolation from river or canal.⁴ The mulberry will not do without water and it is unsuitable for avenues as, for many months, it is quite bare of leaves. Yet the wood seasons and polishes well,

¹ In their capacity of President District Board.

² p. 278.

³ *P.A.R.*, 580-1.

⁴ *sailaba*.



and is strong and useful for building, and for making boats, furniture and agricultural implements, while the leaves are used for fodder and feeding silkworms. Even in the sub-montane district of Kangra and Gurdaspur the mulberry avenues are unsatisfactory, while the tree thrives in irrigated plantations, and in damp soil along canal banks or other tracts subject to percolation.¹ The Eucalyptus has been introduced from Australia and grows rapidly, one species the Eucalyptus rudis, will grow in alkali² soils too barren to support any other tree known to roadside arboriculture. The acacia also will grow almost anywhere, even in heavy rice soils.³

¹ *sailaba*.² *kalar*.³ P.A.R., 582.

APPENDIX I. LIEUTENANT-GOVERNORS OF THE PUNJAB.

Name.	Assumed charge of office.	Remarks.
Sir John Lawrence, Bart., G. C. B.	1st January 1859	(Aft. by creation Baron Lawrence, G. C. S. I.).
Sir Robert Montgomery, K.C.B.	25th February 1859	(Aft. G.C.S.I.) Officiating, Confirmed 1st May 1859.
Donald Friell Meleod, C.B.	10th January 1865	(Aft. K.C.S.I.).
Major-General Sir Henry Durand, K.C.S.I., C.B.	1st June 1870	.. Died at Tank, in the Dera Ismail Khan District, 1st January 1871.
R. H. Davies, C.S.I.	20th January 1871	.. (Aft. K.C.S.I., C.I.E.)
R. E. Egerton, C.S.I.	.. 2nd April 1877	.. (Aft. K.C.S.I., C.I.E.).
Sir Charles U. Aitchison, K.C.S.I., C.I.E.	3rd April 1882	..
James Broadwood Lyall	.. 2nd April 1887	.. (Aft. G.C.I.E., K.C.S.I.).
Sir Dennis Fitzpatrick, K.C.S.I.	5th March 1892	..
William Mackworth Young, K.C.S.I.	6th March 1897	..
Sir C. M. Rivaz, K.C.S.I.,	6th March 1902	..
Sir D. C. J. Ibbetson, K.C.S.I.	6th March 1907	.. And Officiating 27th April to 19th Octo- ber 1905. Resigned 22nd January 1908.
T. G. Walker, C.S.I.	.. 22nd May 1907	.. (Aft. K.C.I.E., C.S.I.) Officiating to 12th August 1907 and from 22nd January 1908.
Sir Louis W. Dane, K.C.I.E., C.S.I.	25th May 1908	.. (Aft. G.C.I.E.).
James McCrone Douie, C.S.I.	28th April 1911	.. (Aft. K.C.S.I.) Offici- ating to 4th August 1911.
Sir M. F. O'Dwyer, G.C.I.E., K.C.S.I.	26th May 1913	..
Sir E. D. MacLagan, K.C.S.I., K.C.I.E.	26th May 1919	..

GOVERNORS OF THE PUNJAB.

Name.	Assumed charge of office.	
Sir E. D. MacLagan, K.C.S.I., K.C.I.E.	3rd January 1921.	
Sir William Malcolm Hailey, K.C.S.I.	1st June 1924.	



APPENDIX II.

THE NORTH-WEST FRONTIER PROVINCE.

The creation of a new administration (the North-West Frontier Province) for the management of the political affairs of the North-West Frontier was proclaimed on the 25th October 1901. Under this proclamation the districts of Hazara, Peshawar and Kohat, the Bannu and Marwat tahsils of Bannu district and the Tank, Kulachi and Dera Ismail Khan tahsils of Dera Ismail Khan district, with a total area of 13,077 square miles, ceased to form part of the Punjab.



APPENDIX III.

THE DELHI PROVINCE.

The present province of Delhi bears little relation to the old Punjab district of that name. That district consisted of three tahsils, Delhi, Sonapat and Ballabgarh. At the time of separation the tahsil of Sonapat with an area of 448 square miles was transferred bodily to the Rohtak district whilst an area of 280 square miles from Ballabgarh tahsil was transferred to the Gurgaon district. The major portion of the old district therefore remained in the Punjab and only the Delhi tahsil went to the new province. Later on the Delhi Province was enlarged by the addition of some 46 square miles from the Meerut district of the United Provinces, and was thus brought to its present size of 593 square miles.



APPENDIX IV.

INDIAN MONEY.

1 rupee = 16 annas = 16×12 pies.

The pre-War rupee was stabilised at 1s. 4d. During the post-War boom in 1920 the rupee rose to about 2s. 6d. whence it fell rapidly to about 1s. 3d. It is now (1931) stabilised at 1s. 6d.

1 lakh = 1,00,000

1 core = 10 millions.

Thus now (1931) Rs. 1 lakh = £13,333.

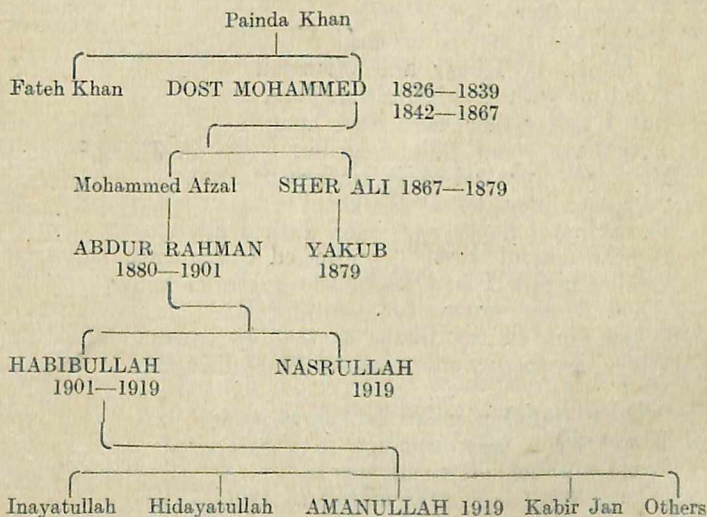
Rs. 1 core = £1½ millions.

APPENDIX V.

AMIRS OF AFGHANISTAN.

ROUGH GENEALOGICAL TABLE.

The names of actual rulers (with dates) are in capitals.



APPENDIX VI.

THE LAY OF THE *Bistar-bandnewala*.¹

I was posted to Jullundur
 (A good station for a wonder !)
 I stayed there just a week
 Which upset me so to speak ;
 A month in Hissar and Mianwali
 Filled me with dreadful melancholy,
 But I had rather have been hung
 Than have spent those long six weeks in Jhang,²
 My hopes were raised by an urgent note,
 "Proceed immediately Sialkot,"
 Those joyful hopes were soon dashed down
 By the doleful wire, "Transferred Gurgaon."
 Twelve nights I had heard the peacocks holler,
 When I got orders for Gujranwala,
 I had sent off my things to the last banana
 When the posting was changed to Ludhiana,

"These transfers make us fellows poor"
 I said when they sent me to Ferozepore,
 I had nothing left to fill my belly
 When they finally sent me off to Delhi.

So now in a noisy rattling train
 I'm going to Lahore—to plead in vain
 To be given a motor caravan
 Fitted complete with a driver man—and
 If I get T. A. for each mile I do
 They can jolly well send me to Timbuctoo.

¹ *Bistar-Bandna* is to roll up bedding. Hence a *bistar bandnewala* is one who is always rolling up bedding, i.e., always on the move. In India it is necessary to carry all your bedding-blankets, mattress, towels and sheets about with you when you travel.

² Pronounced Jhung.

APPENDIX VII.

PUNJAB COURTESY TITLES.

<i>Title.</i>	<i>To whom applied.</i>
Babu ..	.. Originally applied to cadets of noble families, now applied to Hindu Clerks of all the Offices and the Railway Staff.
Bhai ..	.. Any Sikh who is not very prominent.
Bawa ..	.. Bedis (Sikh holy men) in Gurdaspur District.
Chaudhri	.. Jats and Gujjars throughout the Province.
Dewan ..	.. Kashmiri Pandits.
Gosain ..	.. A couple of families of Brahmins in Bhakkar, District Mianwali, are known as Gosain. Also a courtesy title for all Brahmins who have disciples.
Haji ..	.. A courtesy title for a Musalman who has done pilgrimage to Mecca.
Khan ..	.. A courtesy title for Pathans.
Lala ..	.. All Hindus except Brahmins.
Munshi ..	.. A courtesy title for one who has got no other courtesy title.
Mirza	.. Moguls in Gujrat, Gurdaspur, Delhi and Gurgaon Districts.
Mian ..	.. Rajputs of superior class in Gurdaspur District.

Title.

To whom applied.

Misr. ..	.. Brahmins of Mianwali and Gurgaon Districts.
Mir ..	.. Syeds of Gurgaon District.
Malik ..	.. Awans and Tiwanas.
Maulvi ..	.. One who knows Arabic.
Pandit ..	.. A courtesy title for Brahmins.
Prohiat ..	.. A courtesy title for a Brahmin who performs priestly functions.
Qazi ..	.. A courtesy title for the descendants of those persons who held the post of Qazi (judge) during the regime of Mogul Emperors.
Raja ..	.. Rajputs in Gujrat District.
Sardar ..	.. A courtesy title for a prominent Sikh.
Sheikh ..	.. A courtesy title for those Musalmans who have been converted from Hinduism.
Shah Ji	.. Banias in Gurdaspur District are known as Shah Ji. It is also a courtesy title for any Hindu who does money-lending business.
Thakar ..	.. Another courtesy title for Rajputs of superior class in Gurdaspur District.

APPENDIX VIII.
RECORD OF TITLE (JAMABANDI.)

26

1	2	3	4	5	6	7	8	9	10	11	12
Khewat or Jamabandi No :	Khatauni No :	Name of patti or taraf, with name of Lambardar and revenue.	Owner with description	Cultivator with description	Well or other means of irrigation	Field numbers	Area	Rent paid by cultivator, rate and amount	Share or measure of right and rule of bachh	Demands with detail of revenue and Cesses	Remarks



APPENDIX IX

KHASRA GIRDAWARI, OR CROP INSPECTION REGISTER.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Khasra No :	Owner (written short with Jama- bandi No :	Cultivator with rent (written short with Khatauni No :	Area.	Class of land according to last Jamabandi.	Kharif 19 . Rabi 19 .			Kharif 19 . Rabi 19 .			Kharif 19 . Rabi 19 .			Kharif 19 . Rabi 19 .		
					Kharif Crop.	Rabi Crop.	Changes of rights, possession and rent.				Kharif Crop.	Rabi Crop.	Changes of rights, possession and rent.			
								Kharif Crop.	Rabi Crop.	Changes of rights, possession and rent.				Kharif Crop.	Rabi Crop.	Changes of rent, possession and rent.

APPENDIX X.

Milan Raqba, OR YEARLY REGISTER OF AREA.

N. B.— All fractions omitted.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Year.	Total area	Forests	Uncultivated other than Forest			Cultivation.					Total area of crops by jinswar return.	Wells irrigating land.			Kacha wells, <i>dhenklis</i> and <i>jhalars</i> in use during the year.	REMARKS
			Not available for cultivation. (Ghair mumkin).	Unappropriated Government Waste.	Other.	Detail.	Total cultivated area.	Area included in previous column which was not sown with crop this year (khali)	Balance which was sown once or more than once.	Total area of crops grown in each class of soil shown in column 7 irrespective of irrigation.		New wells and old wells which have been made fit for use during the year	Fallen in or become otherwise unfit for use during the year.	Total in use or fit for use.		
						Chahi ..										
						Chahi ..										
						Nahri ..										
						Nahri ..										
						Salib ..										
						Barani ..										
						Total ..										



2. ANNUAL KHARIF CROP REGISTER OF VILLAGE _____

No. 1

3. ANNUAL RABI CROP REGISTER OF VILLAGE-

No. _____

N.B.—All fractions omitted.

[illegible]

APPENDIX XII.

(QUADRENNIAL) ABSTRACT OF OWNERSHIP, MORTGAGES AND REVENUE (Note.—Omit fractions of acres and of rupees).

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Part I. Tenure and ownership.								Part II. Total area held under Mortgages, not including collateral Mortgages but including temporary transfers by order of Court.					Part III. Revenue Assignments.							
Years.	Description of tenure.	Detail of main tribes.	Number of Jama-bandi holdings.	Number of owners and shareholders.	Total.	Of which cultivated.	Revenue Assessment.	Detail.	Number of mortgages.	Total.	Of which cultivated.	Revenue assessment mortgaged land.	Detail.	Number of assignees.	Area of which the Revenue is assigned in whole or in part.	Total assessment of land assigned.	Amount thereof assigned.	Amount of land revenue assigned not by appertinment of land but by cash allotment out of total assessment.	Nazrana annually paid by assignees.	Remarks.
								By members of an Agriculturable tribe. By others					1. In perpetuity. 2. For life or lives. 3. For terms of settlement.							
	Total Village.							Total ..					Total ..							



No. _____

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
Year.	Detail.	Total cultivated area.	Area cultivated by owners.	Area cultivated by tenants free of rent or at a nominal rent.	AREA CULTIVATED BY TENANTS PAYING RENT.							DETAILS OF RENTS IN KIND AND AREA ON WHICH PAID BY TENANTS-AT-WILL.								Share of straw taken by the landlord.	REMARKS.
					With right of occupancy.			Without right of occupancy.				Rent.									
					Paying at revenue rates with or without <i>malikana</i> .	Paying other cash rents.	Paying in kind with or without an addition in cash.	Paying at revenue rates with or without <i>malikana</i> .	Paying other cash rents.	Paying in kind with or without an addition in cash.	Total held by tenants paying rent.	Detail of classes of land (as in <i>Milan Ragba</i>).									
												<i>Zabti</i> rents.									
												$\frac{1}{2}$ produce or more.									
												2/5ths and less than $\frac{1}{2}$.									
												1/3rd and less than 2/5ths.									
												Less than 1/3rd.									
												By fixed amount of produce.									
												Total area under rents in kind.									



APPENDIX XV.

INDIAN WEIGHTS.

1 maund = 40 seers = 640 chitanks = 3,200 tolas.

1 tola = weight of one rupee
= 180 grains.

As 1 lb. avoirdupois weighs 7,000 grains

1 maund = $82 \frac{2}{7}$ lbs.

and 1 seer = 2.06 lbs.

APPENDIX XVI.

THE PRODUCE ESTIMATE.

For let $a_1 a_2 a_3 \dots a_n$ be small areas over which the yield is uniform.

and let $y_1 y_2 y_3 \dots y_n$ be the yields per acre of those areas. Then the actual outturn is

$$y_1 a_1 + y_2 a_2 + \dots + y_n a_n \equiv \Sigma y a$$

But this does not equal the assumed outturn, i. e., the average yield $\times$ total area which is

$$1/n (y_1 + y_2 + \dots + y_n) (a_1 + a_2 + \dots + a_n) \equiv 1/n \Sigma y \Sigma a$$

APPENDIX XVII.

ESTIMATES OF CROP OUTTURN AND CONSUMPTION.

Though provincial estimates based on the village accountant's estimates of yields for particular classes of lands and villages will lead to an increased accuracy, the present method of taking district averages of irrigated and unirrigated crops has furnished results which are admittedly of great value to exporters. These estimates are given in the Season and Crop Reports. It is generally believed that exporters arrive at an approximation to the true outturn by adding about 33 per cent. to the official figures. Probably the official figures are nearer the true outturn than the exporters imagine. We may assume then that the actual outturn is between the official figures and an amount 33 per cent. in excess of that. Let us suppose for the moment that the actual outturn is the official outturn multiplied by $1+x$, where x is the undetermined percentage to be added to the official estimate to arrive at the true figures—(x lying between 0 and $\frac{1}{3}$). This involves the assumption that the percentage under-estimate is the same from year to year, but that is a perfectly reasonable assumption, as, if there is an under-estimate, the same cause will act on it in successive years. If from this estimate of outturn we deduct the amount required for seed and consumption within the province, and net exports (*i. e.*, total exports *less* imports), we shall have the amount added to the stocks in hand in the province during the year. This amount may be negative. If it is added to the carry-over from the preceding year we shall have the total stocks in hand at the end of the year.

The estimates for consumption and stocks in hand can only be approximate, but an endeavour will be made to show that such estimates may nevertheless be combined with the estimates of outturn for purposes of mutual check. It is clear that in estimating consumption other food-grains must be taken into consideration as well as wheat, and estimates of their outturn are also, therefore, necessary. These have also been taken in a similar manner to that of wheat from the Season and Crop Report. Estimates of outturn of other food-grains are compiled in a very similar manner to those for wheat, and it is reasonable to assume that if they are under-estimated, the amount of under-estimate will be proportional to that for wheat.

In making such estimates only round figures are of any value, and therefore the estimates will only be given in million tons to one decimal place. The deductions for seed are relatively small and an approximate estimate for seed is, for wheat, about

30 seers per acre (i.e., of the area over which it was sown¹), and for other food-grains 5 per cent. of the outturn. The exports are obtained from the Internal Trade Report which will has unfortunately been discontinued, though exporters have strongly pressed for its renewal. The figures appended, however, only give exports up to the year 1921-22, after which the Internal Trade Report was discontinued. The export figures may be taken to be strictly accurate within the limits necessary for the purposes of this discussion.

It is in making estimates of consumption that there is the greatest possibility of error. Popular estimates vary from $\frac{3}{4}$ to 1 seer per day per individual. Sir Ganga Ram's figure for the whole of India works out to about half a seer per individual,² but this is probably too small for the Punjab, with a strong manly agricultural population. We may take therefore as a working hypothesis that the wheat consumption lies between $\frac{1}{2}$ and 1 seer per day per individual, and for this purpose the nutritive value of a seer of other food-grains may be equated to that of a seer of wheat. As the Internal Trade Report deals with export from the Punjab, including Indian States, Delhi and North-West Frontier Province, it is necessary to check the consumption of the whole of this area. There are, however, certain Indian States for which there are no outturn returns. They are, however, Hill States which are self-supporting and from which the exports are negligible. The argument will not, therefore, be affected by excluding them from the population statistics on which consumption is based and also from the food outturn figures, and this has been done. The population of the area under consideration is 27 millions. Half a seer per day for this population amounts to 4.5 million tons. The actual consumption is assumed to be 4.5 multiplied by $1+y$, where y lies between 0 and 1. As the statistics given in the Internal Trade Report are for the financial year while the Season and Crop Report deals with the agricultural year, the wheat and gram statistics are in each case those of the succeeding year, e.g., the wheat and gram statistics for the financial year 1913-14 are taken from the Season and Crop Report of 1912-13. Other food-grains are all *kharif* crops with the exception of barley, the amount of which is so small that no great error will be caused by classifying it with the other food-grains and including the amount a year previously. It is impossible to isolate barley as there are no separate statistics given for the export of barley, which is classified with other food-grains. This will serve to show how the following statement is arrived at:—

¹ Roberts 97.

² Sir Ganga Ram. *Agriculture: A Profession*. Address delivered at the Agriculture College, Lyallpur, on 27th March. 1923.

Wheat consumption (figures in million tons) for Punjab including Indian States, Delhi and N. W. F. Province.

1	2	3	4	5	6	7	8	9
Year.	Outturn.	Seed.	Balance.	Net ex- port.	Balance for consumption.	Consumed.	Stocks over.	Net stock carried over.
1912-13	Wh. (1+x) 4.1 G. 1.1 F. 1.9	0.3 0.1 0.1	(1+x) 3.8 1.0 1.8	1.1 0.2 0.3	2.7+3.8 x 0.8+1.0 x 1.5+1.8 x	4.5+4.5y	5.0+6.6 x-4.5-4.5 y	a+0.5+6.6 x-4.5y
1913-14	Wh. 3.4 G. 0.8 F. 2.0	0.3 0.0 0.1	3.1 0.8 1.9	0.9 0.4 0.2	2.2+3.1 x 0.4+0.8 x 1.7+1.9 x	4.5+4.5 y	4.3+5.8 x-4.5-4.5y	a+0.3+12.4 x-9.0 y
1914-15	Wh. 3.5 G. 0.6 F. 2.2	0.3 0.0 0.2	3.2 0.6 2.0	1.0 0.3 0.0	2.2+3.2 x 0.3+0.6 x 2.0+2.0 x	4.5+4.5 y	4.5+5.8 x-4.5-4.5y	a+0.3+18.2 x-13.5
1915-16	Wh. 4.0 G. 1.3 F. 1.8	0.3 0.1 0.1	3.7 1.2 1.7	0.6 0.4 0.1	3.1+3.7 x 0.8+1.2 x 1.6+1.7 x	4.5+4.5 y	5.5, 6.6 x-4.5-4.5y	a+1.3+24.8 x-18.0y
1916-17	Wh. 2.8 G. 0.5 F. 1.4	0.3 0.0 0.1	2.5 0.5 1.3	0.9 0.2 0.1	1.6+2.5 x 0.3+0.5 x 1.2+1.3 x	4.5+4.5 y	3.1+4.3 x-4.5-4.5y	a-0.1+29.1-22.5y
1917-18	Wh. 3.2 G. 0.9 F. 2.2	0.3 0.0 0.3	2.9 0.9 1.9	1.0 0.3 0.3	1.9+2.9 x 0.6+0.9 x 1.6+1.9 x	4.5+4.5 y	4.1+5.7 x-4.5-4.5y	a-0.5+34.8 x-27.0y
1918-19	Wh. 3.7 G. 1.5 F. 1.4	0.3 0.1 0.1	3.4 1.4 1.3	0.6 0.1 0.1	2.8+3.4 x 0.8+1.4 x 1.2+1.3 x	4.5+4.5 y	4.8+6.1 x-4.5-4.5y	a-0.2+40.9 x-31.5y
1919-20	Wh. 3.1 G. 0.5 F. 2.4	0.3 0.0 0.2	2.8 0.5 0.2	0.4 0.2 0.1	2.4+2.8 x 0.3+0.5 x 2.1+2.2 x	4.5+4.5 y	4.8+5.5 x-4.5-4.5y	a+0.1+46.4 x-36.0y

Wheat consumption (figures in million tons) for Punjab including Indian States, Delhi and N. W. F. Province—concl'd.

1	2	3	4	5	6	7	8	9
Year.	Outturn.	Seed.	Balance.	Net ex ports	Balance for consumption	Consumed.	Stocks over.	Net stock carried over
1920-21	{ Wh. 4.2 G. 1.0 F. 1.3	{ 0.3 0.1 0.1	{ 3.9 0.9 1.2	{ 1.0 0.2 0.1	{ 2.9+3.9 x 0.7+0.9 x 1.1+1.2 x	4.5+4.5y	4.7+6.0x-4.5-4.5y	a+0.3+52.4x-40.5y
1921-22	{ Wh. 2.4 G. 0.4 F. 2.2	{ 0.3 0.0 0.2	{ 2.1 0.4 2.0	{ 0.0 -0.2 -0.1	{ 2.1+2.1 x 0.6+0.4 x 2.1+2.0 x	4.5+4.5y	4.8+4.5x-4.5-4.5y	a+0.6+56.9x-45.0y

COLUMN 1. The year taken is the financial year ending on 31st March.

COLUMN 2. Wh. equals wheat, G. equals gram and F. equals other food-grains, i.e., barley, *bajra*, maize, *jowar* and rice. The wheat figures are taken for British territories, i.e., Punjab, N. W. F. Province and Delhi, from the Season and Crop Reports, and for the major Indian States from the Crop Forecasts. The minor Indian States which publish no Forecast are mainly Hill States which do not export and therefore their omission does not affect these figures. Their population is also omitted in the estimate of population. As the outturn of wheat and gram is given in the Season and Crop Report for the land-revenue year ending in September, it is clear that the figures for any particular year for wheat and gram will be entered under the subsequent financial year, and this has been done. The other food-grains with the exception of barley are *khariif* crops and therefore in that case the land-revenue year and financial year correspond. As the Internal Trade Report does not mention barley specially, it is impossible to isolate it, but the amount of barley is so small that no appreciable error will be caused by taking barley for the year subsequent.

COLUMN 3. Estimating wheat seed at 30 seers per acre and other food-grains at 5 per cent.

COLUMN 4 equals column 2 minus column 3.

COLUMN 6 is column 4 multiplied by $(1+x)$ —column 5. x is that fraction which must be added to the estimated outturn to get the true outturn.

COLUMN 7. Population of Punjab, Delhi and N. W. F. Province, excluding minor Indian States, equals 27 millions. Consumption of 27 millions per year at half seer per head per day equals 4.5 million tons. The actual consumption equals $4.5(1+y)$, where y is a proportional fraction that must be added to the half seer to get the true consumption.

COLUMN 8 equals column 7 minus column 6.

COLUMN 9 is a plus totals of previous column 8. Where column 8 is negative it is subtracted. a denotes the stock in hand at the end of the financial year of 1911-12.

LIMITS THAT MAY BE ASSIGNED TO ESTIMATES OF CONSUMPTION.

a is the assumed stock carried over at the commencement of the year 1912-13. Stock remaining at the end of 1921-22 is seen from the statement to be—

$$a + 0.6 + 56.9 x - 45.0 y.$$

Now x and y are fractions. It has already been shown that x lies between 0 and $\frac{1}{3}$.

$$y \text{ ,, ,, } 0 \text{ ,, } 1.$$

$$\text{Put } x = \frac{x_1}{10} \quad y = \frac{y_1}{10}.$$

So that x_1 lies between 0 and $3\frac{1}{3}$

$$y_1 \text{ ,, ,, } 0 \text{ ,, } 10.$$

Then stock at end of 1921-22 = $a + 0.6 + 5.7 x_1 - 4.5 y_1$ approximately.

Now at present there is no means of accurately estimating the amount of stocks in hand, though, as will be seen, a yearly census of the total wheat stocks in the province at the end of the year is under contemplation. In default of such a census there are some limits which may be assigned to the probable amount of stock held over at the end of the year. It is not unreasonable to assume that it does not exceed a million tons in any particular year. There is no reason to suppose that the amount of stocks held over was otherwise than normal at the end of the years 1911-12 and 1921-22. The stocks in hand at the end of both these years may therefore be assumed to be roughly the same, and the difference between them would be sufficiently small to be negligible for the purpose of the rough approximation which has been made for the purpose of this discussion.

Hence carry-over from 1911-12 = carry-over from 1921-22.
 Or $a = a + 0.6 + 5.7 x_1 - 4.5 y_1$ or $45 y_1 = 57 x_1 + 6$.

Now x_1 lies between 0 and $3\frac{1}{3}$.

Hence y_1 lies between $\frac{2}{15}$ and $4\frac{1}{3}$.

Hence y lies between 0.01 and 0.4 (roughly).

We may now put this into ordinary language. If we assume that the estimates of outturn for the last 10 years are correct, then the average consumption per head will be 0.55 seer. If we assume that the estimates are 33 per cent. too small, then the average consumption per head must be 0.7 seer. It has been shown that the outturn must lie between these limits,

and we can therefore deduce fairly close limits for the consumption per head, limits which, it has already been shown, are *prima facie* probable. Thus, though we cannot be certain of the accuracy of our estimates of outturn, and still less of the accuracy of our estimates of consumption, we can connect these estimates with each other in such a way as to use each as a check on the other.

SUGGESTED CENSUS OF STOCKS.

It will now be seen that far more valuable results could be obtained if we had estimates of the amount of the stocks in hand at the end of the financial year, as even if these estimates are liable to considerable error yet as before we might assume that the percentage of error remained constant from year to year, and therefore by a similar line of argument to that which has been applied to outturn and consumption, limits might be assigned within which the amount of stocks in hand must lie. The end of the financial year would be the best time for making such a census as it is both the time when the year for which exports are given commences and also the time when the wheat stocks have reached their lowest and when therefore it would be easiest to take a census of their amount, as then the great mass of wheat is in the *mandi*¹ and there is little left with the zamindar. It has been proposed that such a census should be taken by Deputy Commissioners through *Tahsildars*, who will estimate the stocks with zamindars and in ordinary *mandis*.¹ In cases of large *mandis*¹ the estimates would be obtained from bazaar *chaudhris*,² big merchants or exporting firms. In each case it will be left to the discretion of the Deputy Commissioner to select such methods as he may choose. It is also proposed that Deputy Commissioners in making their estimates should not only give what they consider the probable amount of the stock in hand in the district but also the maximum or minimum limit which they consider possible for these stocks. This will enable us to get some general idea of the possible errors in the estimates of stocks. Assuming that some rough idea of the stock in hand at the end of the year may be obtained by some such methods as this, we should then be in a position to check these results by our figures for outturn and consumption, which could again be used to check the results for stocks, and with each year an increasingly accurate estimate could be framed.

¹Market.

²Representative of Indian traders.

For example, if such a census of stocks had been held during the four years 1918-19 to 1921-22, and the amounts of stocks had been found to be b, b_0, b_1, b_2 , and assuming that the real amounts were $b(1+z), b_0(1+z), b_1(1+z), b_2(1+z)$ where z is a fraction (and may be negative), then we should have—

$$b(1+z) = a - 0.2 + 40.9x - 31.5y$$

$$b_0(1+z) = a + 0.1 + 46.4x - 36.0y$$

$$b_1(1+z) = a + 0.3 + 52.4x - 40.0y$$

$$b_2(1+z) = a + 0.6 + 56.9x - 45.0y$$

Whence results could be obtained for a, x, y, z (b, b_0, b_1, b_2 being known). Such results, if used with caution, could give very valuable information, which could be used to criticise or confirm the accuracy of the methods employed in collecting statistics of outturn and stock. It has also been suggested that a further check on the accuracy of the results could be obtained from districts such as Hissar or Lyallpur, which have little road communication with outside districts, and where by getting figures for outturn, net export, consumption, and stocks for those districts alone, further check might be made on the accuracy of the statistical methods employed for the province as a whole.

APPENDIX XVIII.

UNITS OF LENGTH AND AREA.

The units of length and area have a primitive origin. The simplest way of measuring land is by pacing. When a man in walking steps out first with his left foot, the pace or *qadam* is the distance between the heel of the right foot in its original position and the heel of the same foot after it has been advanced in front of the left foot to complete the second step. A *qadam* is the usual unit of measures of length and a square *qadam* the unit of measures of area. In the east of the Punjab where the *bigha* is the local measure, the square *qadam* is known as the *biswansi*; in the west, where the *ghumao* is employed, it is known as the *sarsahi*. Twenty *biswansis* make a *biswa*, and twenty *biswas* a *bigha*. Nine *sarsahis* make a *marla*, twenty *marlas* a *kanal* and eight *kanals* a *ghumao*. The *bigha* of the Western Punjab is one half of a *ghumao*. As the average height of a man in different localities varies greatly, it is not surprising that the local measures in use were found to be far from uniform. The variations have been reduced, but not abolished, in the British settlement surveys. The *bigha* employed in some settlements in the east of the Punjab is $\frac{5}{24}$ ths of an acre. It is usually known as the *lachcha bigha*, to distinguish it from the old Mughal measure known as the *shahjahani* or *pakka bigha*, which is exactly three times as large. Where the *shahjahani bigha* is the unit of area the linear measure is not the *qadam*, but the *gatha* of 99 inches. The *qadams* in use vary from 54 to 66 inches, the latter being the most usual length. It is also the most convenient for where it is employed the *ghumao* is exactly equal to an acre¹.

¹P.A.R., 252.

APPENDIX XIX

VALUE OF CANAL IRRIGATED LAND.

The best way of ascertaining the value of canal irrigated land is by contrasting the receipts that a landlord would obtain from growing a typical irrigated crop such as wheat with what he would have got from growing a typical unirrigated crop such as gram. As a matter of fact much of the canal irrigated land would not have been suitable as *barani* land even for gram. But as gram can be grown fairly generally on *barani* land, it is assumed for the sake of this argument that it would be grown. It is necessary therefore to contrast receipts *less* expenditure per acre on irrigated wheat with receipts *less* expenditure per acre on unirrigated gram. A rough average yield for irrigated wheat may be assumed to be 16 maunds per acre and an average price Rs. 4/- a maund. The value of the crop will therefore be Rs. 64/-. The produce of unirrigated gram naturally varies considerably according to the rainfall, but it is reasonable to take an average of 7 maunds per acre and an average price of Rs. 3/- per maund, the value of the produce in this case being Rs. 21/-. The difference per acre is therefore Rs. 43/-. In neither case has the cost of cultivation so far been considered, and it is not necessary to go into the total cost. It will suffice to give an estimate of the difference between the costs of cultivation. Irrigated wheat would require three ploughings more than unirrigated gram and the cost of these may be roughly estimated at Re. 1/- each or a total extra cost of Rs. 3/-. The land revenue and water rate on irrigated wheat is about Rs. 5/8/- per acre while that on unirrigated gram would be about Re. 1/-. Therefore, the extra charges on the canal crop amount to Rs. 4/8/-. The total extra charges on the canal land therefore amount to Rs. 7/8/- leaving a net profit per acre to the landowner after paying all Government charges and all costs of cultivation of Rs. 35/8/-. If the rent is a cash rent the greater portion of this would go to the landowner. If on the other hand the rent is *batai* the tenant will succeed in obtaining a larger share.

These theoretical results are proved in practice by the wealthy condition of the landowners in canal irrigated tracts. The wealth thus acquired makes the landowner wealthy and enables the cultivator to pursue a system of cultivation which

is far less thorough than that followed on *chahi*¹ land. This can be clearly seen in the wastefully large *kiaris*² made by cultivators in canal lands as compared with the careful husbanding of water in small *kiaris* on *chahi*¹ land. If we assume that 5 per cent. is the ordinary interest which the purchaser of land expects to get in rent then this means that the extra value of the canal irrigated land over wheat it would have been if it had been irrigated, is about Rs. 500/- per acre. Here again the theoretical value is not very different from that which obtains in practice. For the purpose of this argument the possibility of growing an extra fodder crop after wheat on canal irrigated land has been ignored as these crops are not always grown and it is difficult to estimate their value.

¹ Land irrigated from wells.

² Compartments into which a field is divided for purposes of irrigation. (pp. 293_n, 304_n).

APPENDIX XX.

WEEDS.

Name.	Scientific Name.	Length of life.	Season.
Dub (grass) ..	<i>Cynodon dactylon</i> ..	Perennial ..	Summer.
Baru (grass) ..	<i>Sorghum halepense</i> ..	Perennial ..	Summer.
Dabh (grass) ..	<i>Eragrostis cynosuroides</i> ..	Perennial ..	Summer.
Dila ..	<i>Cyperus tuberosus</i> ..	Perennial ..	Summer.
Sanwank ..	<i>Panicum colonum</i> ..	Annual ..	Summer.
Piazi ..	<i>Asphodelus fistulosus</i> ..	Annual ..	Winter.
Bathu ..	<i>Chenopodium album</i> ..	Annual ..	Winter.
Poli (thistle) ..	<i>Carthamus oxyacantha</i> ..	Annual ..	Winter.
Leh ..	<i>Cirsium arvense</i> ..	Annual ..	Winter.
Lehli ..	<i>Convolvulus</i> ..	Perennial ..	Winter.
(Creeper) ..	<i>Arvensis</i> ..	Perennial ..	Winter.
Maina ..	<i>Medicago denticulata</i> ..	Annual ..	Winter.
Maini ..	<i>Trigenella polyserrata</i> ..	Annual ..	Winter.
Takla (cow cockle) ..	<i>Saponaria vaccaria</i> ..	Annual ..	Winter.
Rari ..	<i>Vicia sativa</i> ..	Annual ..	Winter.



APPENDIX XXI.

SOWN AREA OF PRINCIPAL CROPS FOR THE YEARS 1917-18 TO 1926-27 IN MILLIONS OF ACRES.

Crops.	Irrigated and Unirrigated.	1917-18.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.
Wheat	Irrigated ..	4.66	4.74	4.88	4.99	4.90	5.05	5.01	4.73	5.10	1.05
	Unirrigated ..	5.27	2.94	3.93	2.76	3.88	4.57	4.67	4.93	4.38	4.33
	Total ..	9.93	7.68	8.81	7.75	8.78	9.62	9.68	9.66	9.48	9.38
Barley	Irrigated ..	.27	.49	.37	.39	.39	.33	.31	.25	.30	.26
	Unirrigated ..	1.20	.37	.83	.24	.72	.84	.94	.69	.50	.50
	Total ..	1.47	.86	1.20	.63	.11	1.17	1.25	.94	.80	.76
Rice	Irrigated ..	.73	.60	.74	.71	.62	.74	.69	.39	.74	.64
	Unirrigated ..	.27	.14	.22	.21	.20	.19	.19	.19	.23	.24
	Total ..	1.00	.74	.96	.92	.82	.93	.88	.78	.97	.88
Maize	Irrigated ..	.29	.58	.53	.48	.52	.51	.45	.38	.38	.38
	Unirrigated ..	.92	.57	.63	.58	.59	.61	.60	.54	.55	.59
	Total ..	1.21	1.15	1.16	1.06	1.11	1.12	1.05	.92	.93	.97

¹From the Punjab Season and Crop Report 1926-27.

APPENDIX XXI—*concl.*

Crops.		Irrigated and Unirrigated.	1917-18.	1918-19.	1919-20.	1920-21.	1921-22.	1922-23.	1923-24.	1924-25.	1925-26.	1926-27.
Bajra	{	Irrigated ..	·19	·22	·26	·23	·42	·39	·31	·29	·26	·26
		Unirrigated ..	2·35	1·34	2·41	2·19	2·90	2·73	2·54	2·29	2·30	2·43
		Total ..	2·54	1·56	2·67	2·42	3·32	3·12	2·85	2·58	2·56	2·69
Jowar	{	Irrigated ..	·14	·18	·20	·23	·27	·21	·19	·22	·17	·18
		Unirrigated ..	·68	·47	·82	·69	·94	·74	·79	·83	·75	·80
		Total ..	·82	·65	1·02	·92	1·21	·95	·98	1·05	·92	·98
Gram	{	Irrigated ..	·77	·65	·82	·82	1·18	1·18	·96	·94	·91	·92
		Unirrigated ..	5·23	1·40	3·30	1·41	3·97	4·25	3·24	4·75	2·80	3·76
		Total ..	6·00	2·05	4·12	2·23	5·15	5·43	4·20	5·69	3·71	4·68
Oilseeds	{	Irrigated ..	·44	·36	·46	·48	·64	·64	·62	·70	·48	·57
		Unirrigated ..	·98	·38	·57	·24	1·62	·86	·68	·74	·43	·46
		Total ..	1·42	·74	1·03	·72	1·66	1·47	1·30	1·44	·91	1·03



Sugarcane ..	{	Irrigated ..	..	·41	·36	·39	·38	·33	·44	·40	·31	·30	·36
		Unirrigated ..	..	·09	·11	·09	·08	·05	·06	·08	·09	·09	·08
		Total ..	..	·50	·47	·48	·46	·38	·50	·48	·40	·39	·44
Cotton* ..	{	Irrigated ..	..	1·27	1·27	1·84	1·72	1·05	1·15	1·54	2·06	2·42	2·27
		Unirrigated ..	..	·37	·15	·23	·24	·10	·12	·21	·27	·28	·25
		Total ..	..	1·64	1·42	2·07	1·96	1·15	1·27	1·75	2·33	2·70	2·52
Fodder crops	{	Irrigated ..	..	1·83	2·15	2·18	2·32	2·57	2·55	2·26	2·37	2·45	2·45
		Unirrigated ..	..	2·18	·93	1·59	1·47	1·52	1·68	1·85	1·65	1·82	1·70
		Total ..	..	4·01	3·08	3·77	3·79	4·09	4·23	4·11	4·02	4·27	4·15
Total area of crops sown.	{	Irrigated ..	..	11·55	12·19	13·21	13·29	13·60	13·80	13·35	13·37	14·09	13·94
		Unirrigated ..	..	21·32	3·66	15·90	11·27	17·42	17·99	17·25	17·35	15·62	16·46
		Total ..	..	32·87	21·85	29·11	24·56	31·02	31·79	30·60	31·72	29·71	30·40
*	{	Irrigated ..	Desi	..	..	..	..	·65	·77	·94	1·10	1·27	1·14
			American	..	..	..	..	·40	·38	·60	·96	1·15	1·13
		Unirrigated ..	Desi	..	..	..	..	·10	·12	·21	·27	·28	·25
			American	..	..	..	..	..	..	..	..	..	..
		Total ..	Desi	..	..	..	..	·75	·89	1·15	1·37	1·55	1·39
			American	..	..	..	..	·40	·38	·60	·96	1·15	1·13

APPENDIX XII.
PRINCIPAL PUNJAB CROPS.

English Name.	Botanical Name.	Vernacular Name.	Season for Sowing.	Season for Har-vesting.	Natural Order.
Wheat	.. <i>Triticum vulgare</i> ..	Kaaak	.. Oct., Nov., Dec. ..	March, April, May	Gramineæ.
Barley	.. <i>Hordeum vulgare</i> ..	Jau	.. Oct., Nov., Dec. ..	March, April, May	Gramineæ.
Gram	<i>Cicer arietinum</i> ..	Channa, chhola	.. Aug., Sept. Oct. ..	March, April	.. Leguminosæ.
Cotton	.. <i>Gossypium herbaceum</i>	(Kapas, kapah) (vanwar).	March to July	.. Sept. to January	Malvaceæ.
Sugarcane	.. <i>Saccharum officinarum</i>	Kamad	.. March, April	.. Nov. to January	Gramineæ.
Rice	.. <i>Oryza Sativa</i> ..	Dhan, chawal, munji.	(April, May beds) (July transplant)	October, November	Gramineæ.
Linseed	.. <i>Linum usitatissimum</i>	Alsi	.. October	.. April	.. Linæ.
Colsa	.. <i>Brassica campestris</i> .. (<i>var. toria</i>).	Toria, Sarshaf	.. October, Nov.	.. April	.. Cruciferae.
Peas	.. <i>Lathyrus sativus</i> ..	Mattar, charral	.. Octr., November	March, April	.. Leguminosæ.
Great millet	.. <i>Sorghum vulgare</i> ..	Jowar, chari	.. July, Aug., Sept...	Oct., Nov., Dec. ..	Gramineæ.
Spiked millet	.. <i>Pennisetum typhoideum</i>	Bajra	.. July, August	.. October, Nov.	.. Gramineæ.



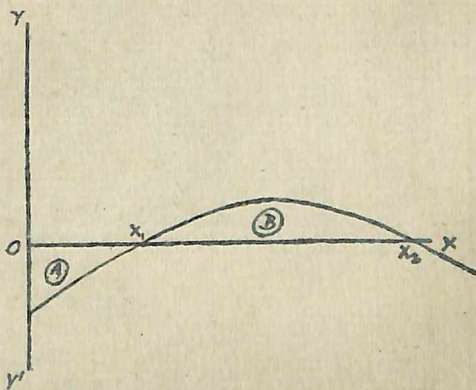
Maize or Indian corn	<i>Zea mays</i>	.. Makki	.. June, July, Aug.	Sept., Oct., Nov.	Gramineæ.
Moth	<i>Phaseolus aconitifolius</i>	Moth	.. July, Aug., Sept...	Nov., December	} Leguminosæ.
Mash	<i>Phaseolus aconitifolius Radiatus.</i>	Mash Mah	.. July, Aug. Sept. .	Nov., December	
Mung	<i>Phaseolus aconitifolius Mungo.</i>	Mung	.. July, Aug., Sept...	Nov., December	
Pulse	<i>Oplismenus frumentaceus</i>	Sawak	.. July	.. October	Leguminosæ.
Sesamum	<i>Sesamum orientale</i>	.. Til	.. July, August	.. December	Pedalineæ.
Cummin	<i>Cumminum officinale</i>	.. Zira	.. Oct., November	.. March	..
Taramira	<i>Eruca sativa</i>	.. Taramira	.. Oct., November	.. March	Cruciferae.
Saffron	..	Kassumba	.. Oct. November	.. March	..
Lentil	<i>Lensesulenta</i>	.. Massur, massar	.. Oct., Nov., Dec.	.. March, April	Leguminosæ.
Hemp	<i>Crotalaria juncea</i>	.. San, sanné	.. June, July	.. November	Leguminosæ.
Tobacco	<i>Nicotiana tabacum</i>	.. Tamaku	.. March, April	.. June, July	Solanaceæ.
Poppy	<i>Papaver somniferum</i>	.. Post	.. October, Nov.	.. April	..
Melons	<i>Cucumis melo</i>	.. Vali, kharbuza	.. March, April	.. May, June	Cucurbitaciæ.
Beans	<i>Dolichos uniflorus</i>	.. Rawan	.. August	.. November	..

APPENDIX XXII—*concll.*CSL
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English Name.	Botanical Name.	Vernacular Name.	Season for Sowing.	Season for Har-vesting.	Natural Order.
Turnips	<i>Brassica rapa</i>	Sag, gonglu, shal-gam.	August, Sept., Oct.	Dec., Jan., Feb.	Cruciferae.
Rape	<i>Brassica campestris</i> (<i>var. glauca</i>).	Sarson	Oct., November	March	Cruciferae.
Trefoil	<i>Trigonella Trifoleum</i>	Methra	Oct., Nov., Dec.	March	Leguminosae.
Vegetables	..	Tarkari	Sept., Oct., Nov.	Dec., Jan., Feb., March, April.	
China	<i>Panicum miliaceum</i>	China	March, April August, Sept.	June, November.	Gramineae.
Italian millet	<i>Pennisetum Italicum</i>	Kangni	May	August, Sept.	
Lucerne	<i>Medicago sativa</i>	Lusan	All seasons	All seasons	Leguminosae.
Oats	<i>Avena sativa</i>	Jawi	Oct., Nov., Dec.	March, April, May	Gramineae.
Guara	<i>Cyamopsis psoralioides</i>	Guara	June, July, August	Sept., Oct., Nov.	Leguminosae.
Mustard	<i>Brassica Juncea</i>	Rai	Sept., Oct., Nov.	March	Cruciferae.

APPENDIX XXIII.

PROFIT AND LOSS ON CATTLE.



Let OX measure time, and OY profit made by an animal, so that OY^1 measures negative profit or loss.

When an animal is born it costs money, and continues to cost more than it earns till a time OX_1 after which it earns more than it costs, which it continues to do until a time OX_2 when it again costs more than it earns. The figure A represents cost of maintenance as a calf. B represents profit made during productive period. If B is less than A then the animal is not worth breeding. In no case should the animal be kept alive after OX_2 when it ceases to be profitable.

Note (1). Sentimental considerations may keep the animal alive, but it should then be clearly recognised that it is kept as a pet and not as profitable investment.

Note (2). The diagram is only symbolic and does not attempt to reproduce quantities accurately.



APPENDIX XXIV.

IMPORTANT PUNJAB TREES AND SHRUBS.

<i>English Name.</i>	<i>Vernacular Name.</i>	<i>Botanical Name.</i>	<i>Remarks.</i>
Himalayan spruce ..	Babool, kikar ..	Acacia arabica ..	Grows rapidly, requires little water, thrives on poor soil.
	Tós, ráo or rái ..	Abies smithiana ..	
	Phuláhi ..	Acacia modesta ..	
	Siris ..	Albizzia Lebbeck ..	
	Safed siris ..	„ procera ..	
Bamboo ..	Báns ..	Pembusa arundinacea ..	Petals of flowers used for dyeing.
Silk Cotton tree ..	Simbal, simal ..	Bombax malabaricum ..	
Flame of the Forest ..	Chichhra, dhák ..	Butea frondosa ..	
Leafless caper ..	Karíl, karír ..	Capparis aphylla ..	
	Papáya, arand-kharbúza ..	Carica papaya ..	
Spanish Chestnut ..	..	Castanea vulgaris ..	Deodar.
Himalayan Cedar ..	Diár, kelu ..	Cedrus deodara ..	
Orange ..	Nárangí, santra ..	Citrus aurantium ..	



Citron, lime,
Pumelo or shaddock

Male Bamboo

Australian Gum tree

Banyan tree

Fig tree

Mountain Ash

Colocynth gourd

American yellow poppy

Walnut

Mango

Persian lilac

Horse radish tree

Mulberry

.. Nimbu
.. Chakotra
.. Lasúra
.. Shísham, sissu, tahli
.. Báns
.. Loqát
..
.. Jaman
.. Bor, bargad
.. Anjir
.. Pípal
.. Sum, sunnu
.. Phalsa
.. Dhaman, bihul
.. 'Ak

.. Akhrot
.. 'Am, amb
.. Bakain, dhrek
.. Ním
.. Sohánjna
.. Tūt

..
..
.. Cordia mysca
.. Dalbergia sissoo
.. Dendrocalmus strictus
.. Eriobotrya japonica
.. Eucalyptus
.. Eugenia jambolana
.. Ficus bengalensis
.. Ficus carica
.. „ religiosa
.. Fraxinus floribunda
.. Grewia asiatica
.. „ oppositifolia
.. Calotropis procera

.. Citrullus colocynthus

.. Argemone Mexicana
.. Juglanas regia
.. Mangifera indica
.. Melia azedarach
.. „ indica
.. Moringa ptery-gosperma
.. Morus alba

.. N. O. Tiliaceae
.. N. O. Asclepiade
.. laeiae.
.. N. O. Cucurlit-
.. aciae.

.. N. O. Meliaceae.



APPENDIX XXIV—concl'd.

<i>English Name.</i>	<i>Vernacular Name</i>	<i>Botanical Name</i>	<i>Remarks.</i>
Plantain	.. Kela	.. Musa paradisiaca	
	Kamlai	.. Odina modier	
Olive	.. Kau	.. Olea cuspidata	
Date-palm	.. Khajur	.. Phoenix dactilifera	
	Palundar	.. Picca vibiana	
Blue pine	.. Kail, bair	.. Pinus excelsa	
Pine	.. Chir, chíl	.. „ longifolia	
	Kakkar	.. Pistacia integerrima	
Plane tree	.. Chinar	.. Platanus orientalis	
Black poplar	.. Safedar	.. Populus nigra	
	Jand	.. Prosopis spicigera	
Almond	.. Badam	.. Prunus amygdalus	
Apricot	.. Chirmchuli	.. „ armeniaca	
Cherry	.. Gilas	.. „ cerasus	
Plum	.. Alucha	.. „ communis	
Peach	.. Aru	.. „ persica	
Guava	.. Āmrút, amrúd	.. Psidium guava	
Pomegranate	.. Anár	.. Punica granatum	



Pear	..	Náspáti	..	<i>Pyrus communis</i>	
Apple	..	Seo, seb	..	„ <i>malus</i>	
Ban Oak	..	Ban	..	<i>Quercus incana</i>	
Rhododendron	..		..	<i>Rhododendron arborum</i>	
Weeping Willow	..		..	<i>Salix babylonica</i>	
Willow	..	Bed leila	..	„ <i>tetrasperina</i>	
		Jál Wan	..	<i>Salvadora oleoides</i>	
		Pilu	..	„ <i>persica</i>	
Tamarisk	..	Farash	..	<i>Tamarix articulata</i>	
		Bahera	..	<i>Terminalia bellerica</i>	
Grape	..	Dakh, angúr	..	<i>Vitis vinifera</i>	
		Ber	..	<i>Zizyphus jujuba</i>	
Wild pear	..		..	<i>Pyrus pashia</i>	
Mohra oak	..	bahera	..	<i>Quercus dilatata</i>	
				<i>Terminalia belerrica</i>	.. N. O. Combretaceae
Loon	..	Tun	..	<i>Cedrela toona</i>	
		Sanattha mendra	..	<i>Dodonaea viscosa</i>	.. N. O. Sapindaceae

APPENDIX XXV.

SALES OF CULTIVATED LAND.²

Year.	Area transferred (thousand acres).	Price per acre. (rupees).	¹ Quinquennial average price (rupees).
1896-97	1,49	78	..
1897-98	1,68	81	..
1898-99	1,55	83	81
1899-1900	1,60	81	80
1900-01	1,81	83	78
1901-02	1,43	71	78
1902-03	1,39	71	79
1903-04	1,32	85	80
1904-05	1,23	86	86
1905-06	1,42	85	92
1906-07	1,14	1,03	98
1907-08	1,21	1,01	1,05
1908-09	1,23	1,14	1,14
1909-10	1,26	1,21	1,18
1910-11	1,23	1,29	1,19
1911-12	1,52	1,23	1,46
1912-13	1,85	1,07	1,58
1913-14	1,22	2,49	1,75
1914-15	1,34	1,80	1,96
1915-16	1,07	2,16	2,25
1916-17	1,07	2,27	2,12
1917-18	1,01	2,52	2,31
1918-19	1,42	1,84	2,57
1919-20	1,43	2,75	2,88
1920-21	1,38	3,45	3,01
1921-22	1,35	3,85	3,40
1922-23	1,26	3,14	..
1923-24	1,19	3,83	..

¹ The quinquennial averages are in each case those of the year in question and of the two years immediately before and after.

² Taken from P.A.R. (1924-25)62.

GLOSSARY.

References are to pages, where full explanations of these vernacular terms will be found. II means Volume II.

ABBREVIATIONS :—App.=Appendix.

n=note

f. ff.=following page, pages.

Vernacular terms should be pronounced as follows:—

ā : as in palm.

ā : as in Buddha, or u in up.

ê : as in fête, or a in mate

î : as in police

i : as in fit.

o : as in pope

û : as in rule or oo in pool

u : as in put.

There is no short e or o. Other vowels are pronounced short unless ai: as i in site they are marked long. Ch, sh, j, w, and y all follow the ordinary English pronunciation, but ph, dh, and th are sounded separately as in creep home, bad house, pent house. In words of Hindi origin kh is sounded separately as in block-head, in words of Persian or Arabic origin as ch in Scotch loch. n is sometimes nasal.

A.

- Ābādi* (village site), 12n, 169n, 210n, 284n, II 191n.
Ābi (land watered by lift), 212n.
Ābiāna (water-rate), 287n.
Akālī Dal (army of God), 129, 134, 130.
Akālīs (militant Sikhs), 95, 130.
Akāl Takht (central Sikh shrine), 128.
Alwān (serge), II 208.
Arzī Dawa (plaint), 171n.
Arz irsal (revenue memorandum), 158n.

B.

- Babbar* (Lion; epithet of Sikh band), 135.
Bāchh (distribution of land revenue over holdings), 225n.
Bāgh (garden), 55.
Bail-gārī (bullock-cart), 372n.
Bair (Persian wheel drum), 235n.
Bājra (spiked millet), 310n, 331n, II 342.
Band (irrigation embankment), 232n, II 189.
Bania (shopkeeper, see also under Moneylender), 252n, 368n, II 40.

- Banjar* (fallow), 212n.
Bagaia (unallotted lands), 286n.
Bār (uplands), 276n.
Bārānī (unirrigated land), 212n, 322n, 328n.
Bāru (a grass), 313.
Batai (grain share), 216n, II 10n, 11n, 12n.
Bhang (drug), II 310.
Bhūsa (wheat chaff used as fodder), 328n, 354n.
Bigha (area) App. XVIII, 216n.
Bulbul (nightingale), II 207n.

C.

- Chāhī* (land irrigated by wells), 201n, 212n, 222n.
Chak (area irrigated by outlet), 292f.
Chakal (Persian wheel toothed disc), 235n.
Chali (Persian wheel earthenware bucket), 235n.
Channa (gram), 350n.
Charas (drug), II 127, 310f.
Charī (great millet as fodder), 354n.
Chārpāi (bed), II 287n.
Charsa (leather bucket for well-irrigation), 236n, II 339.

Chashm (eye), II 207n.
Chauk (village square), 209n.
Chaukidār (village watchman), II 294.
Chīl (pine), II 345.
Chinkāra (ravine deer), 346n.
Chirāga (grazing land), 284n.
Chūtānk (2·06 oz.), App. XV.
Cho (torrent bed), 384n.
Chogha (dressing gown), II 208n.
Chuhra (sweeper), 372n.
Chumār (tanner), 372n.
Cröre (10 millions), App. IV.

D.

Dafadār (head-watchman), II 294n.
Dāghdār (spotty, doctor), II 171n.
Dākar (clay), 212n.
Dākhila bahī (revenue receipt register), 158n.
Darī (cotton rug), II 207n.
Dastak (writ of demand), 159.
Dastur-ul-amal (settlement hand-book), 226n.
Desī (indigenous), 319n, 339n.
Dhān (rice), 331n.
Dharat (village common fund), 224n.
Dhār kalān (main river channel), 220n.
Doāba (land between two rivers), 135n.
Dumba (fat-tailed sheep), 382n.

F.

Faqīr (Muhammadan holy man), 21.
Farāsh (tamarisk), II 344.
Fard dhāl bākh (revenue demand statement), 158n.
Fastāna (share of crop), II 285n.

G.

Gabrūn (superior *khes*), II 207n.
Ganda (dirty), II 199.
Garbī loi (cloth), II 207n.
Ghair mumkin (unculturable), 212n.
Ghar (home), II 199.
Gharyāl (fish-eating crocodile), 346n.
Ghāti (diaper), II 207n.
Ghī (clarified butter), 203n, 366n, 369n, II 284n.
Girdawari (harvest inspection), 157n, 158n.

Godām (godown, granary), 314n.
Gohn (hollow near well), 236n.
Gorā (land near village site), 212n.
Gurāth (Sikh Bible), 9, 126, 132.
Guārā (cyamopsis *poraliorides*), 312n, 331, 355.
Gur (raw sugar), 203n, 336n, II 211n.
Gurdwārā (Sikh shrine), 127.
Guru (Sikh spiritual head), 8.
Gwālā (cowherd), 367n.

H.

Haisiyat (substance), II 242n, 262.
Hal (plough), 319n.
Haqq (right), 286n.
Haqq ābpāshī (right of irrigation), 300n.
Havildār (sergeant), II 299n.
Hiḡrat (Muhammadan pilgrimage), 124n.
Hiran (Indian antelope), 346n.
Huqa (hookah, Indian pipe), II 73.

I.

Ilāqa (magistrate's charge), II 281f.

J.

Jadīd (new), 212n.
Jāgīr (land revenue assignment), 163n, II 2n.
Jāgīrdār (holder of jagir), II 1n.
Jāl (tree), II 344.
Jamabandī (Record of Rights), 180n, 183n, 184n, 188n, 210n, App. VIII.
Jama Wāsil Bāqī (Yearly revenue account), 197n.
Jand (tree), II 344.
Jatha (Sikh band), 130n.
Jau (barley), 329nm.
Jawāb dawa (reply), 171n.
Jhāran (napkin; duster), II 32n.
Jhil (lake), 212n, 374n.
Jinswār (crop register), App. XI 197n.
Jirga (council of elders), 140n, II 291.
Jowār (great millet), II 342.

K.

- Kachh* (Sikh drawers), 126.
Kakka (Sikh k), 126n.
Kallar (alkali land), 391.
Kanak (wheat), 326n.
Kanāl (area), App. XVIII, 216n.
Kanga (comb), 126.
Kankar (limestone used for road metal), II 97n.
Kapās (seed cotton), 340.
Karā (iron bangle), 126.
Kāthā (variety of sugarcane), 334.
Kes (uncut hair of Sikhs), 126.
Khālifa (Caliph), 34n.
Khāls (Sikh organisation), 8.
Khān (Pathan tribal chief), 15, 24.
Khanda (steel knife), 126.
Kharāba (failed crop), 202n.
Kharbūza (melon), 343n.
Kharif (autumn harvest), 157n, 162n, 316n, 354n, II 341n.
Khasra girdāwarī (harvest inspection), 173n, 184n, App. IX.
Khāta khatauni (cultivation holding), 181n.
Khāta khewat (proprietary holding), 181n.
Khatauni (village revenue account), 157n.
Khes (checked longcloth), II 206f.
Khilāfat (organisation on behalf of Caliph), 34, 124.
Khushk (dry), II 286n.
Kiārī (irrigation compartment), 293n, 304n, App. XIX.
Kikar (acacia), II 344.
Kili (toggle), 236n.
Killa (rectangle), 282, 293.
Killabandī (system of dividing land in killas), 281f, 296, II 19.
Kirpān (Sikh sword), 130.
Kuhl (irrigation channel), 233n.

L.

- Lakh* (100,000), App. IV.
Lal kitab (see Village Note Book).
Lambardār (village headman), 14n, 151n, 173ff, 185, II 238.
Langur (grey ape), 346.
Lipārā (land near village site), 212n.
Lohār (ironmonger), 237n, 322n.
Lungi (loincloth, turban), II 206ff.

M.

- Magar* (crocodile), 346n.
Mahāl (estate), 151n.
Mahant (Abbot of Sikh shrine), 127n, 131n.
Mairā (loam), 212n.
Malba (village common fund), 14n, 224n, II 238.
Malik (proprietor of land), 287n.
Malikāna (proprietary rent), 287n.
Man (maund), 82 2/7 lbs., App. XV.
Mandī (market), II 109, 118, 122.
Mauza (village), 151n, 169n.
Milan Raqba (Yearly register of area), App. X, 197n.
Mir Munshī (vernacular clerk to Governor), 76.
Mochī (cobbler), 372n.
Muāmila (land revenue), 287n.
Muhājirīn (Muhammadan pilgrims), 124n.
Muharrir (vernacular clerk), 70n.
Mulqātī (interviewer), 95.
Munna (shaven; short-haired Sikh), 126n.
Munsif (subordinate Judge), 69, 71, 96, II 255f.

N.

- Nahl* (Persian wheel rope ladder), 235n.
Nahrī (canal-irrigated land), 201n, 212n, 289n.
Naib-Nāzīr (Assistant to Nazir), 70.
Naib-Tahsildār (Assistant to Tahsildar; see also under Tahsildar), 69, 152, II 291.
 ————transfers of, 75.
Nakabandī (picketing system), II 295.
Nala (nullah, irrigation channel), 233n, 248n, 249n, II 98.
Namda (coloured felt), II 207n, 208n.
Nanakpanthī (short-haired Sikh), 126n.
Nānkī (short-haired Sikh), 126.
Nāzīr (sheriff), 70.
Nazrana (present, bribe), 220n.
Nihang (Sikh devotee), 130.

P.

- Pachotra* (headman's surcharge), 223n.
Pagri (turban), II 206.
Pahārī (hill), 364n.
Pahra (three hours), 293.
Pakul (Sikh baptism), 126.
Paijāma (trouser), II 208n.
Pana (sub-division of village), 12n, 164n.
Panch (five), II 239f.
Panchāyat (village council), 13n, 174n, II 174, 238ff.
Pargana (sub-division of tahsil), 140.
Pārha (hog-deer), 346n.
Pashm (goat's hair), II 207.
Pashmina (piece-goods made from pashm), II 208.
Pattu (coarse woollen cloth), II 208n.
Patwārī (see Village accountant).
Patwārkhāna (patwaris' house) 185n.
Phulkārī (embroidered shawl), II 157, 209.
Pilu (fruit of the jal), 377n.
Pinjra (lattice work), II 209.
Ponda (variety of sugarcane), 334.
Pukhta (matured crop), 202n.
Purdah (Seclusion of women) II 73ff, 183.

Q.

- Qadam* (66 inches), App. XVIII, 282n.
Qadīm (old), 212n.
Qānūngo (supervisor of patwaris), 151f, 181f, 187f, 200, II 235, 326.
Qasāi (butcher), 372n.
Qistbandī (revenue roll), 163n.
Qurān (Muhammadian Bible), 139.

R.

- Rabi* (spring harvest), 158n, 162n, 316n, 354n, II 341n.
Rahat (Persian wheel), 235.
Rakhti (perpetual loan), II 52n.
Rāi (mustard), 341.
Rākha (guard for crops), II 20.
Raveli (loam), 212n.
Rishwat (bribe), 285n.
Riwāj (customary dues), 285n.
Riwāj-i-am (record of customs), 139.
Rohri (clay), 212n.

S.

- Sadar* (headquarters), 163n.
Sāg (vegetable), 341n.
Sahukar (money-lender), II 40.
Sailāb (land irrigated by percolation), 201n, 212n, 222, 390n, 391n.
Sahjdarī (short-haired Sikh), 126.
Sanād (Mogul imperial rescript), 244n, (British rescript), II 3n, (worthless certificate issued by British), 119n.
Sarkār (Mogul district), 7n.
Sāwanī (autumn harvest), 316n.
Senjī (Indian clover), 333n, 355n.
Ser (2·06 lbs), App. XV.
Shaftal (Kabuli clover), 355n.
Shajra kishitwār (field map), 182n.
Shajra nash (genealogical tree), 182n.
Shāmīlāt (village common land), 164n, 183n.
Shatranjī (cotton rug), II 207n.
Shisham (tree), 387, 390, App. XXIV.
Shuddhī (Hindu movement), 94n, 137.
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